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Technical Note 281

MATERIALS FOR PLACEBO V

WILLIAM C. WATT

U. S. DEPARTMENT OF COMMERCE
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NATIONAL BUREAU OF STANDARDS

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Materials for PLACEBO V

William C. Watt

This paper presents materials which make the microgrammar PLACEBO V accessible to inspection. In the form given here, the microgrammar may be used in company with the requisite computer programs for producing or analyzing English sentences of a certain biological dialect, as part of a 'Question/Answer' device.

PLACEBO V includes its predecessor, PLACEBO IV, in the sense that every sentence generated by the earlier microgrammar is generated in the same way by the later one. This and other kinds of 'inclusion' are considered, and related to practical problems of microgrammar-design.

0. Introduction.

This paper consists almost entirely of materials on PLACEBO V, a microgrammar of about 2,100 context-free rules.[1] These materials comprise a listing of the rules of the microgrammar and a selection of sentences produced from those rules by a computer 'service program.' In addition, since perhaps the most interesting facet of PLACEBO V (if it has any at all) is that it 'radically includes' its predecessor, PLACEBO IV[2], I will briefly discuss properties of inclusion, and will also list the two microgrammars side-by-side for ease of comparison.

Considered as a computer-algorithm only, PLACEBO V is shown here in a form which may be examined independently of any other papers on its natural-language aspects or its proposed functions. Taken as a natural-language microgrammar, however, and as a functioning part of the "ITSELF" artificial-intelligence system (reference below), it is presented less autonomously: a clearer understanding of the properties of PLACEBO V, and of the points discussed, may be gained from consulting

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1 The research on which this paper is based has been supported by the National Institutes of Health under Agreement NB-05613-01.

In the format used (and explained) below, these 2,107 context-free rules are compressed into 1,090 'amalgam' rules.

2 For a detailed presentation of the earlier microgrammar, see PLACEBO IV: Rules, Concordance, Sample Computer Generation, NBS Technical Note 255; Washington: 1965. PLACEBO IV contains 1,167 context-free rules, formatted as 676 'amalgam' rules.

three other papers. These are "Analysis, Synthesis, and Description of Biological Images"[3], A Prerequisite to the Utility of Microgrammars,[4] and General Properties of Microgrammars.[5] In addition, the aforementioned piece on PLACEBO IV may be consulted for a discursive presentation of the manner of producing sentences from the rules of microgrammars like PLACEBO IV and V.[6]

PLACEBO V is one of a sequence of microgrammars of which the last will be a working component of the "ITSELF" system, as described in Lipkin, Watt, and Kirsch op.cit. (There will probably be no more than three further microgrammars in this series: perhaps fewer.) Briefly, the "ITSELF" system will enable neuropathologists to use a computer as an ally in the analysis of pictures of brain-tissue, and of sets of such pictures. The final PLACEBO will allow its users to describe such pictures (or 'sections') in English sentences, to query the computer in English and to issue instructions in English for picture-processing. The computer, in turn, will respond in English. As the "micro-" prefix indicates, the final PLACEBO will be able to analyze only a very small set of English sentences---though this set is infinitely large---; so that in a way only a semblance of speaking English is offered the neuropathologist. If the user is to derive any real benefit, then,

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3 Lewis E. Lipkin, William C. Watt, and Russell A. Kirsch, Annals of the New York Academy of Sciences (to appear).

4 William C. Watt, NBS Technical Note 258; Washington: 1965.

5 William C. Watt (forthcoming).

6 In informal use no harm is done by synonymizing "production" and "generation," but more formally speaking the two should be kept distinct. Roughly, it may be said that a generative grammar (like PLACEBO V) generates sentences, if the grammar is well-formed, without any processing taking place: "generating" is something like the "equalling" done by the formula "2+2=4." A grammar produces sentences when the rules are actually used (by a human or a computer) to determine real sentences---i.e. to write them down in some way. (The analog is "He added 2 and 2 and got 4"). A grammar may "generate" an infinite number of sentences (as both PLACEBO IV and V do); but the number of sentences it "produces" is always finite.

from being allowed to 'speak English', the set of sentences available to him must be chosen with some care: it must be such a set as he will not be constantly overstepping in his efforts to say what he wants. A set of sentences which is adequate in this way I have elsewhere[7] called a "habitable" microgrammar. Of course there is no reason to expect that it will be possible to build a microgrammar which is completely habitable: my goal is only to approach this ideal as closely as possible: to achieve maximum practicable habitability.

PLACEBO V is nowhere near reaching even this more modest goal, but it wasn't expected to be. This microgrammar was developed with a more immediate objective in mind: that of creating a "core" grammar of sufficient syntactical and lexical variety (and consistency among sets of variants) so that needed additions could be made with some facility and with little perturbation of the rules so far integrated. The procedures for deriving such a "core" microgrammar are at present best described as ad hoc; but PLACEBO V is indeed proving easy to expand, and so the procedures can be said to have worked. Unless, of course, the "core" was arrived at serendipitously and/or unless any moderately large microgrammar constitutes such a "core;" but neither of these suppositions is very plausible.

From this point on the process of developing microgrammars of the PLACEBO series will be quite different. PLACEBO IV and V have been brought this far by adding assumedly general-purpose structures (containing neuropathological lexicon) which are anticipated to be useful and/or to lend the microgrammar 'extrapolative symmetry'[7]. But henceforward only structures specifically produced by neuropathologists will be added (together with their obvious extrapolations). As of this writing the microgrammar is slowly expanding while being constantly checked, against neuropathological discourse, for habitability.

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7 See the Prerequisites paper.

In the meantime, it may be remarked that in an admittedly unrigorous experimental situation, about one-third of the sentences volunteered by one neuropathologist were found to be already generated by PLACEBO V. For various reasons---including lack of a mechanical parser to check the validity of these 'findings'---I do not attach very much importance to this result, though I insist on being heartened by it.

This paper is divided into three main sections. Section 1 opens with a key to the format in which these microgrammars are written, and then proceeds to a full listing of the rules of PLACEBO V, with the PLACEBO IV rules en face.

Section 2 discusses grammatical 'inclusion,' and exposes some disadvantages of requiring PLACEBO V to include its predecessor.

Section 3 lists a number of sentences machine-generated from the PLACEBO V rules.

NBS Technical Report 8934, Concordance to the Rules of PLACEBO V, provides a supplement to these materials which should be of particular value to anyone adapting the microgrammar to some use of his own.

1. The Rules of PLACEBO V, with those of PLACEBO IV en face.

1.1. Prefatory Note.

What follows is a complete listing of the rules of the two micro-grammars PLACEBO V and PLACEBO IV. The rules for each are given in alphanumeric order[8], except that the initiating grammatical category 'S' is listed first. Most of the categories, as will be evident, have names which are of mnemonic value to people working with the micro-grammars; these mnemonics are not entirely consistent, however, and contribute nothing to the algorithmic functioning of the microgrammars.

The PLACEBO grammars are in what is known generally as the 'Simple (or Context-Free) Phrase Structure' model, but they are written in an unusual format.

The symbol " = " is identical to the more traditional "$\longrightarrow$", and is to be interpreted as "is instantiated as."

The function of " , " may be exemplified by the rule "S = DIR,STTT"; this rule is equivalent to the two 'normal' rules "S = DIR
= STTT". Thus,
" , " may be read as "or."

The symbol " + " is to be interpreted as "concatenated with to the Right."

In sum, then, the PLACEBO V (and also PLACEBO IV) rule

AJC = AJCA, AJCB, AJCC+AJFIXE, AJCD+AJFIXE

is equivalent to the rules:

AJC = AJCA
= AJCB
= AJCC + AJFIXE
= AJCD + AJFIXE

Two other conventions must be explained. The symbol " * " flanks all terminals, as in the rule "ABT = * ABOUT*". All symbols on the left

8 Letters are in order A...Z, numerals are in order 0...9, letters precede numerals, '12' follows '11' but also follows '112'.

of " = " having terminal (starred) symbols on the right, are instantiated only as terminals: such terminal-instantiators I will elsewhere refer to as 'penterminal' symbols. Note that the penterminal symbol "X" has the instance "* *"---that is, its instance is a space. Use of the "X" penterminal constitutes a kind of 'overt deletion', in the production of strings; its function is more fully explained in the General Properties paper.

Note lastly that a "terminal" consists only and entirely of what appears between asterisks.[9] For example, the terminal quoted above is not "about", but " about", with preceding space. Spaces must be introduced in this way, given the 'service programs' cited below, whenever in the production of strings it is desirable to separate terminal symbols, e.g. words. This preceding space is omitted when the terminal is a suffix, for example---e.g. AJFIXING = *ING*---and in general whenever a terminal may be directly preceded by another terminal. If a terminal (e.g. *REGULAR*) may be preceded either by another printed terminal (e.g.* IR*) or by space (as when "regular" is not negated), then this space is introduced by means of a "Z" penterminal, whose only instance is "* *".

In the form presented here, both microgrammars have been 'weighted' for production purposes. That is, to prevent the frequent occurrence of very long strings with low readability, certain rules have been weighted with several "X" penterminals, in order that the 'generating' program, in making its random choices, will have a statistical probability of choosing to delete certain symbols rather than entering their further instances and thus entering a recursive loop. If used

9 Actually this is quite false, except in an informal context (such as this one) where the term "terminal symbol" refers to symbols appearing in produced strings and strings to be parsed. Strictly speaking, of course, the terminal symbols include their flanking asterisks: for otherwise such a rule as "L = *L*" would introduce into the grammar a no-exit recursive loop. More exactly, then, the PLACEBO service-programs print out PLACEBO terminals less their asterisks.

as they are for parsing purposes, these micrograммars will be faulty instruments, for wherever one of these 'favored' deletions is analyzed as present in the input string, the parsing program will be at pains to point out that the deletion (=terminal space) could have resulted from, first, the first 'X' of the rule in question; from, secondly, the second 'X' of that rule; and so on. To be spared such tiresome news, one must remove all but one 'X' from each rule in which more than one 'X' occurs.

For ease of comparison, I have insured that each rule in PLACEBO V which expands a rule in PLACEBO IV, will be found on the page facing the page on which that PLACEBO IV counterpart appears. No other significance is to be attached to the varying number of rules displayed on the PLACEBO IV pages.

```
S=DIR,STTT,Q,A.
A=YN+PT.
ABT=* ABOUT*.
ADJ=ADJC,ADJV.
ADJC=AJJC+AJJA.
ADJV=AJJV+AJJA.
ADJ3=AJJ3A,AJJ3B,AJLGVC.
ADVBCPV=ADVORMR,ADVORLS.
ADVOR=SPQR+DFIXWD.
ADVORLS=LS+ADVOR.
ADVORMR=MR+ADVOR.
AJC=AJCA,AJCB,AJCC+AJFIXE,AJCD+AJFIXE.
AJCA=AJCAA,AJCAB.
AJCAA=AJCAAA,AJCAAB.
AJCAAA=* LIGHT*,* DARK*.
AJCAAB=* GRAY*,* BLACK*.
AJCAB=* SMALL*,* ROUND*.
AJCB=* BIG*.
AJCC=AJCCA,AJCCB.
AJCCA=* WHIT*,* BLU*.
AJCCB=* LARG*.
AJCD=* DENS*.
AJCPV=AJMR,AJLS.
AJFIXAL=*AL*.
AJFIXAR=*AR*.
AJFIXD=*D*.
AJFIXE=*E*.
AJFIXED=*ED*.
AJFIXELLATE=*ELLATE*.
AJFIXIC=*IC*.
AJFIXICAL=*ICAL*.
AJFIXING=*ING*.
AJFIXIVE=*IVE*.
AJFIXL=*L*.
AJFIXLIC=*LIC*.
AJFIXO=*O*.
AJFIXTH=*TH*.
AJFIXTHER=TH+ER.
AJFIXULAR=*ULAR*.
AJJA=X,AJJB+AND+AJJJ.
AJJB=X,X,X',CM+AJJD.
AJJC=AJC,AJLGC,AJCPV.
AJJD=AJJJ+AJJB.
```

```
S=DIR,STTT,Q,A.
A=YN+PT.
ABT=* ABOUT*.
ADJ=ADJC,ADJV.
ADJC=AJJC+AJJA.
ADJV=AJJV+AJJA.
ADJ3=AJJ3A,AJJ3B,AJLGVC,AJLGLK3.
ADVBCPV=ADVORMR,ADVORLS.
ADVOR=SPQR+DFIXWD.
ADVORLS=LS+ADVOR.
ADVORMR=MR+ADVOR.
AJ=AJJJC,AJJJV.
AJBAA=VVYBA+I+AJFIXABL.
AJC=AJCA,AJCB,AJCC+AJFIXE,AJCD+AJFIXE.
AJCA=AJCAA,AJCAB.
AJCAA=AJCAAA,AJCAAB.
AJCAAA=* LIGHT*,* DARK*.
AJCAAB=* GRAY*,* BLACK*.
AJCAB=* SMALL*,* ROUND*,* SHARP*.
AJCB=* BIG*.
AJCC=AJCCA,AJCCB.
AJCCA=* WHIT*,* BLU*.
AJCCB=* LARG*.
AJCCC=AJCCA,AJCCB,AJCAAA,AJCAAB,AJCAB.
AJCD=* DENS*.
AJCPV=AJMR,AJLS,PUM+AJMR,PUM+AJLS.
AJCQFC=AJCCC+AJFIXISH.
AJDTPA=* FREQUENT*.
AJDTPOSA=AJNEGFXC+AJBAA.
AJDTPOSB=* OCCASIONAL*.
AJFIXABL=*ABL*.
AJFIXAL=*AL*.
AJFIXAR=*AR*.
AJFIXD=*D*.
AJFIXE=*E*.
AJFIXED=*ED*.
AJFIXELLATE=*ELLATE*.
AJFIXIC=*IC*.
AJFIXICAL=*ICAL*.
AJFIXING=*ING*.
AJFIXISH=*ISH*.
AJFIXIVE=*IVE*.
AJFIXL=*L*.
AJFIXLIC=*LIC*.
AJFIXLK=*-LIKE*.
AJFIXMT=*MOST*.
AJFIXO=*O*.
AJFIXTH=*TH*.
AJFIXTHER=TH+ER.
AJFIXUAL=*UAL*.
AJFIXULAR=*ULAR*.
AJJA=X,AJJB+AND+AJJJ.
AJJB=X,X,X,CM+AJJD.
AJJC=AJC,AJLGC,AJCPV,JAJC,RELABC.
AJJD=AJJJ+AJJB.
```

PLACEBO IV

```
AJJJ=AJJC,AJJV.
AJJV=AJLGV.
AJJ3A=AJCAA,CLR,AJCCB+AJFIXE,AJCD+AJFIXE.
AJJ3B=NCBABA+AJFIXAL,NCBABBA+NFIX1RIL+AJFIXLIC,
 NCBABC+AJFIXULAR,PRNCBAC+AJFIXAR,NCBABDA+AJFIXAL,
 NCBABEA+AJFIXULAR,NCBAC+AJFIXAR, NCBAD+AJFIXIC, NCBAE+AJFIXL,
 NCBAABA+AJFIXICAL.
AJLG=AJLGC,AJLGV.
AJLGC=AJLGCA,AJLGCB,AJLGCC.
AJLGCA=Z+AJLGCAABC,AJLGCAD.
AJLGCAA=*DEFINED*.
AJLGCAB=*REGULAR*.
AJLGCAC=*DEFINITE*.
AJLGCAD=* PEAR-SHAPED*,* FUSIFORM*.
AJLGCAABC=AJLGCAA,AJLGCAB,AJLGCAC.
AJLGCB=NNBAA+AJFIXAR,NNBAB+AJFIXULAR,NNBAC+AJFIXED,
 NNBAD+AJFIXELLATE.
AJLGCC=NCBAD+AJFIXIC,NCBAE+AJFIXL,
 NCBAC+AJFIXIC.
AJLGV=AJLGVA,AJLGVC.
AJLGVA=AJNEGFXA+AJLGCAA,AJNEGFXB+AJLGCAB,AJNEGFXC+AJLGCAC.
AJLGVC=NVBAA+AJFIXIC,NVBAB+AJFIXL,NVBAC+AJFIXAL,
 NVBAD+AJFIXAL,NVBAEBRV+NVBAEFUL+AJFIXAL.
AJLS=LS+AJNCT.
AJLT=LT+AJNCT.
AJMR=AJCA+ER,AJCB+G+ER,AJCC+ER,MR+AJLG.
AJMT=AJCA+EST,AJCB+G+EST,AJCC+EST,MT+AJLG.
AJNCT=ADVOR,AJC,AJLG.
AJNEGFXA=* UN*.
AJNEGFXB=* IR*.
AJNEGFXC=* IN*.
AJNP1=AJNP1V,AJNP1C.
AJNP1C=ADJC+N111,N111C.
AJNP1V=ADJV+N111,N111V.
AJNP2=ADJ+N222,N222.
AJNP3=ADJ3+N333,N333.
AJOB=ADJ,MST,LOC,AJOBP.
AJOBP=AJVPSVA+XAS+DND.
AJP1NEG=EEE1NEG+AJOB.
```

```
AJJJ=AJJC,AJJV.
AJJJC=AJC,AJLGC.
AJJJV=AJLGV.
AJJV=AJLGV,JAJV,RELABV.
AJJ3A=AJCAA,CLR,AJCCB+AJFIXE,AJCD+AJFIXE.
AJJ3B=NCBABA+AJFIXAL,NCBABBA+NFIX1RIL+AJFIXLIC,
 NCBABC+AJFIXULAR,PRNCBAC+AJFIXAR,NCBABDA+AJFIXAL,
 NCBABEA+AJFIXULAR,NCBAC+AJFIXAR, NCBAD+AJFIXIC, NCBAE+AJFIXL,
 NCBAABA+AJFIXICAL.
AJLG=AJLGC,AJLGV.
AJLGC=AJLGCA,AJLGCB,AJLGCC,AJLGLKC12,
 AJCQFC.
AJLGCA=Z+AJLGCAABC,AJLGCAD.
AJLGCAA=*DEFINED*.
AJLGCAABC=AJLGCAA,AJLGCAB,AJLGCAC.
AJLGCAB=*REGULAR*.
AJLGCAC=*DEFINITE*.
AJLGCAD=* PEAR-SHAPED*,* FUSIFORM*.
AJLGCB=NNBAA+AJFIXAR,NNBAB+AJFIXULAR,NNBAC+AJFIXED,
 NNBAD+AJFIXELLATE.
AJLGCC=NCBAD+AJFIXIC,NCBAE+AJFIXL,
 NCBAC+AJFIXIC.
AJLGLKC12=AJNC12+AJFIXLK.
AJLGLKV12=NVBAX1+AJFIXLK.
AJLGLK3=NN3+AJFIXLK.
AJLGRLV=* LEFT*,* RIGHT*.
AJLGRLVA=* TOP*,* BOTTOM*.
AJLGV=AJLGVA,AJLGVC,AJLGLKV12.
AJLGVA=AJNEGFXA+AJLGCAA,AJNEGFXB+AJLGCAB,AJNEGFXC+AJLGCAC.
AJLGVC=NVBAA+AJFIXIC,NVBAB+AJFIXL,NVBAC+AJFIXAL,
 NVBAF+AJFIXUAL,
 NVBAD+AJFIXAL,NVBAEBRV+NVBAEFUL+AJFIXAL.
AJLGVD=* EXTREME*.
AJLS=LS+AJNCT.
AJLT=LT+AJNCT.
AJMR=AJCA+ER,AJCB+G+ER,AJCC+ER,AJCD+ER,MR+AJLG.
AJMT=AJCA+EST,AJCB+G+EST,AJCC+EST,AJCD+EST,
 MT+AJLG,AJRLV+AJFIXMT.
AJNCT=ADVOR,AJC,AJLG.
AJNC12=NCBAX1,NNBAB+NFIX1LE,NNBAD+NFIX1AR,PRNCBAC+NFIX1E,
 PRNCBAD,PRNCBAN,PRNCBAQ+NFIX1E.
AJNEGFXA=* UN*.
AJNEGFXB=* IR*.
AJNEGFXC=* IN*.
AJNP1=AJNP1V,AJNP1C.
AJNP1C=ADJC+N111,N111C.
AJNP1V=ADJV+N111,N111V.
AJNP11=AJNP1,AJSPV+N111.
AJNP2=ADJ+N222,N222.
AJNP3=ADJ3+N333,N333.
AJOB=ADJ,MST,LOC,AJOBP.
AJOBAM=ADJ,MST.
AJOBP=AJVPSVA+XAS+DND.
AJP1NEG=EEE1NEG+AJOB,EEE1NEG+DTNEGA+AJOB,EEE1POS+DTNEGB+AJOB,
 HVAUX1N+XDNA+CPBCPP+AJOBAM,HVAUX1+XDNB+CPBCPP+AJOBAM,
```

```
AJP1POS=EEE1POS+AJOB.
AJP2NEG=EEE2NEG+AJOB.
AJP2POS=EEE2POS+AJOB.
AJP3NEG=EEE3NEG+AJ3OB.
AJP3POS=EEE3POS+AJ3OB.
AJREL=AJRELA,Z+AJRELB,AJRELC.
AJRELA=* DIFFERENT*.
AJRELB=*DISTINGUISHABLE*.
AJRELC=AJNEGFXC+AJRELB.
AJSPV=AJMT,AJLT.
AJVPSVA=LABL+L+VPSVFXED.
AJ3OB=ADJ3+POAJ,MST,LOC,AJOBP.
AL=* ALL*.
ALL=* ALL*.
ALPC=DETAL+DFDK1+NICON.
AND=* AND*.
ANDOR=* AND*,* OR*,* AND/OR*.
AP=* APART*.
ARPREAR3=PREAR+DFDK1.
AS=* AS*.
AT=* AT*.
AV=* AVERAGE*.
AWAY=* AWAY FROM*,* FROM*.
BERT=Z+NBR29+DJUNA.
BIT=* BIT*.
BU=X,LU.
BY=* BY*.
CALL=VCALL+OBVCALL.
```

```
 EEE1NEG+CMSJCM+AJOB.
AJP1POS=EEE1POS+AJOB,EEE1POS+DTPOS+AJOB,
 HVAUX1+XD+CPBCPP+AJOBAM,
 EEE1POS+DSJPOS+AJOB.
AJP2NEG=EEE2NEG+AJOB,EEE2NEG+DTNEGA+AJOB,EEE2POS+DTNEGE
 HVAUX2N+XDNA+CPBCPP+AJOBAM,
 HVAUX2+XDNB+CPBCPP+AJOBAM,
 EEE2NEG+CMSJCM+AJOB.
AJP2POS=EEE2POS+AJOB,EEE2POS+DTPOS+AJOB,
 HVAUX2+XD+CPBCPP+AJOBAM,
 EEE2POS+DSJPOS+AJOB.
AJP3NEG=EEE3NEG+AJ3OB,EEE3NEG+DTNEGA+AJ3OB,
 HVAUX3N+XDNA+CPBCPP+AJ3OBAM,
 HVAUX3+XDNB+CPBCPP+AJ3OBAM,
 EEE3POS+DTNEGB+AJ3OB,EEE3NEG+CMSJCM+AJ3OB.
AJP3POS=EEE3POS+AJ3OB,EEE3POS+DTPOS+AJ3OB,
 HVAUX3+XD+CPBCPP+AJ3OBAM,
 EEE3POS+DSJPOS+AJ3OB.
AJREL=AJRELA,Z+AJRELB,AJRELC.
AJRELA=* DIFFERENT*.
AJRELB=*DISTINGUISHABLE*.
AJRELC=AJNEGFXC+AJRELB.
AJRLV=AJLGRLV,AJLGRLVA.
AJSPV=AJMT,AJLT.
AJVPSVA=LABL+L+VPSVFXED,LABL+VPSVFXED.
AJ3OB=ADJ3+POAJ,MST,LOC,AJOBP.
AJ3OBAM=ADJ3+POAJ,MST.
AL=* ALL*.
ALL=* ALL*.
ALPC=DETAL+DFDK1+NICON.
AND=* AND*.
ANDOR=* AND*,* OR*,* AND/OR*.
AP=* APART*.
ARGEN=*-S*.
ARINV=* THE*.
ARPN1=ARPN11+UNO,EA.
ARPN11=EA,EVERY.
ARPN2=QFR2,XJD+ALL.
ARPN2Q=QFR2BQ.
ARPREAR3=PREAR+DFDK1.
AS=* AS*.
AT=* AT*.
AV=* AVERAGE*.
AWAY=* AWAY FROM*,* FROM*.
A8A=* USUAL*,* GENERAL*.
A8B=* PROBABL*,* POSSIBL*.
BERT=Z+NBR29+DJUNA.
BIT=* BIT*.
BU=X,LU.
BY=* BY*.
CALL=VCALL+OBVCALL.
CHARYBDIS=PREPDIRA+PSFS+CLC.
CJ=* AND*,* BUT*.
CJBEC=CJBECA,CJBECB.
CJBECA=CJBECAA,CJBECAB.
```

```
CLC=* O-CLOCK*.
CLCE=* 1*,* 2*,* 3*,* 4*,* 5*.
CLCN=* 10*,* 11*,* 12*,* 1*,* 2*.
CLCS=* 4*,* 5*,* 6*,* 7*,* 8*.
CLCW=* 7*,* 8*,* 9*,* 10*,* 11*.
CLR=AJCAAB,AJCCA+AJFIXE.
CM=*, *.
CORX=* ON THE X COORDINATE*.
CORY=* ON THE Y COORDINATE*.
CPV=AJCPV,ADVBCPV.
CYTO=* CYTO*.
DEC=Z+PTT+NBR.
DEF=DFDK1+AJNP1,DEFAR+AJSPV+N111.
DEFAR=* THE*.
DEF1=DFDK1+AJNP1.
DEF11=EA+OF+DEF2.
DEF111=DEF1,DEF11.
DEF2=DFDK2+AJNP2.
DERITH=DERITH1,DERITH2.
DERITH1=NUM1+MU1.
DERITH2=NUM2+MU2.
DETAL=AL+OF.
DFDK1=DEFAR,DKAR1.
DFDK2=DEFAR,DKAR2.
DFIXWD=*WARD*.
DIR=DIRR+PT.
DIRR=LYZ,SYN,LAB.
DJUNA=* TIMES*.
```

```
CJBECAA=* BECAUSE*.
CJBECAB=* EVEN THOUGH*,* THOUGH*,* WHEREAS*.
CJBECB=CJBECBA+N8+THT.
CJBECBA=CJBECBAA,CJBECBAB.
CJBECBAA=* IN SPITE OF*,* DESPITE*.
CJBECBAB=CJBECBABA,CJBECBABB.
CJBECBABA=* DUE TO*.
CJBECBABB=CJBECAA+OF.
CJBECK=CJBECA,CJBECB.
CJCM=XCM+CJ.
CJEO=* EITHER*.
CJEOA=* OR*.
CJJ=SEMICOL+CJJJ.
CJJJ=CJBECAA,CJBECAB,CJBECB,CJ,RGO.
CJPLYA=XCM+CJPLYAA,CM.
CJPLYAA=* THEN*.
CJPLYC=XCM+CJPLYAA,CM,XCM+THENN.
CLC=* O-CLOCK*.
CLCE=* 1*,* 2*,* 3*,* 4*,* 5*.
CLCN=* 10*,* 11*,* 12*,* 1*,* 2*.
CLCS=* 4*,* 5*,* 6*,* 7*,* 8*.
CLCW=* 7*,* 8*,* 9*,* 10*,* 11*.
CLR=AJCAAB,AJCCA+AJFIXE.
CLRSP=XIU+NFIX1NS.
CM=*, *,*,*.
CMJJCM=CMSJCM,XCMJJXCM.
CMSJCM=CM+SJSJ+CM.
COLOR=* COLOR*.
CORX=* ON THE X COORDINATE*.
CORY=* ON THE Y COORDINATE*.
CPBCPP=PPVBC,PPVRM.
CPV=AJCPV,ADVBCPV.
CYTO=* CYTO*.
DEC=Z+PTT+NBR.
DECL=PTT+NBR.
DEF=DFDK1+AJNP1,DEFAR+AJSPV+N111.
DEFAR=* THE*.
DEF1=DFDK1+AJNP1.
DEF11=EA+OF+DEF2.
DEF111=DEF1,DEF11.
DEF2=DFDK2+AJNP2.
DEF3=DFDK3+AJNP3.
DERITH=DERITH1,DERITH2.
DERITH1=NUM1+MU1.
DERITH2=NUM2+MU2.
DETAL=AL+OF.
DFDK1=DEFAR,DKAR1.
DFDK2=DEFAR,DKAR2.
DFDK3=DEFAR,DKAR3.
DFIXWD=*WARD*.
DFXLY=*LY*.
DFXY=*Y*.
DIR=DIRR+PT.
DIRR=LYZ,SYN,LAB.
DJUNA=* TIMES*.
```

```
DKAR1=* THIS*.
DKAR2=* THESE*.
DL=* --((-- *.
DND=DL+NPOLAB+DR.
DO=* DO*.
DR=* --))-- *.
EA=* EACH*.
EEE1NEG=EEE1POS+NOT.
EEE1POS=* IS*.
EEE2NEG=EEE2POS+NOT.
EEE2POS=* ARE*.
EEE3NEG=EEE3POS+NOT.
EEE3POS=* IS*.
EE1NEG=EE1POS+NOT.
EE1POS=* IS*.
EE2NEG=EE2POS+NOT.
EE2POS=* ARE*.
EE3NEG=EE3POS+NOT.
EE3POS=* IS*.
EO=* EACH OTHER*.
EOB1=PRON1,N1.
EOB2=PRON2,EPRDN2.
EOB3=PRON3,EPRDN3.
EPRDN2=EPRDQFAR+PO2.
EPRDN3=EPRDN33+PO3.
EPRDN33=EPRDQFR+AJNP3.
EPRDQFAR=EPRDQFR+AJNP2.
EPRDQFR=* *.
EP1NEG=E1NEG+EOB1.
```

```
DKAR1=* THIS*,* THAT*.
DKAR2=* THESE*,* THOSE*.
DKAR3=* THIS*,* THAT*.
DL=* --((-- *.
DND=DL+NPOLAB+DR.
DO=* DO*.
DQ=DT,DTPOS.
DR=* --))-- *.
DSJPOS=SAJD,CMSJCM,SJSJSJ.
DT=* EVER*.
DTNA=* NEVER*,* SELDOM*.
DTNB=JC+DT.
DTNEGA=DT,DTPOSBA,DTPOSA.
DTNEGB=DTNA,DTNB.
DTPA=DTPAA,DTPAB.
DTPAA=* OFTEN*.
DTPAB=AJDTPA+DFXLY.
DTPB=A8A+DFXLY,A8B+DFXY.
DTPOS=XJD+DTPOSA,DTPOSB.
DTPOSA=DTPOSAA,AJDTPOSA+DFXY.
DTPOSAA=* ALWAYS*.
DTPOSB=DTPOSBA,DTPOSBB.
DTPOSBA=DTPA,DTPB.
DTPOSBB=DTPOSBBA,UAXACTUN.
DTPOSBBA=* SOMETIMES*.
EA=* EACH*.
EEE1NEG=EEE1POS+NOT.
EEE1POS=* IS*.
EEE2NEG=EEE2POS+NOT.
EEE2POS=* ARE*.
EEE3NEG=EEE3POS+NOT.
EEE3POS=* IS*.
EE1NEG=EE1POS+NOT.
EE1POS=* IS*.
EE2NEG=EE2POS+NOT.
EE2POS=* ARE*.
EE3NEG=EE3POS+NOT.
EE3POS=* IS*.
EO=* EACH OTHER*.
EOB1=PRON1,N1.
EOB2=PRON2,EPRDN2.
EOB3=PRON3,EPRDN3.
EPRDN2=EPRDQFAR+PO2.
EPRDN3=EPRDN33+PO3.
EPRDN33=EPRDQFR+AJNP3.
EPRDQFAR=EPRDQFR+AJNP2.
EPRDQFR=* *.
EP1=EP1NEG,EP1POS.
EP1NEG=E1NEG+EOB1,E1NEG+DTNEGA+EOB1,E1POS+DTNEGB+EOB1,
 HVAUX1N+XDNA+CPBCPP+EOB1,
 HVAUX1+XDNB+CPBCPP+EOB1,
 E1NEG+CMSJCM+EOB1.
EP1POS=E1POS+EOB1,E1POS+DTPOS+EOB1,
 E1POS+DSJPOS+EOB1,
 HVAUX1+XD+CPBCPP+EOB1.
```

```
EP1POS=E1POS+EOB1.
EP2NEG=E2NEG+EOB2.
EP2POS=E2POS+EOB2.
EP3NEG=E3NEG+EOB3.
EP3POS=E3POS+EOB3.
EQ=* =*.
EQL=EQU+POEQ.
EQU=* EQUAL TO*.
ER=*ER*.
EST=*EST*.
EVERY=* EVERY*.
EXTR=VEXTR+POVEXTR.
E1NEG=E1POS+NOT.
E1POS=* IS*.
E2NEG=E2POS+NOT.
E2POS=* ARE*.
E3NEG=E3POS+NOT.
E3POS=* IS*.
FORGE=VFRG+N123.
FRCN=Z+NBRMDGT+YINGDANG+NBR29.
FROM=* FROM*.
FROMRK=FROM+DFDK1+MRK.
G=*G*.
GAVIN=* MANY*.
HQ=VHQBAA+VHQBAB.
HQOB1=LYZMSTT1V+EQL,LYZMSTT1C+EQL.
HQOB2=INDFRA+LYZMSTT2A+EQL,INDFRAN+AV+LYZMSTT2B+EQL.
HQOB3=LYZMSTT1V+EQL,LYZMSTT1C+EQL.
```

```
EP2=EP2NEG,EP2POS.
EP2NEG=E2NEG+EOB2,E2NEG+DTNEGA+EOB2,E2POS+DTNEGB+EOB2,
 HVAUX2N+XDNA+CPBCPP+EOB2,HVAUX2+XDNB+CPBCPP+EOB2,
 E2NEG+CMSJCM+EOB2.
EP2POS=E2POS+EOB2,E2POS+DTPOS+EOB2,
 E2POS+DSJPOS+EOB2,
 HVAUX2+XD+CPBCPP+EOB2.
EP3=EP3NEG,EP3POS.
EP3NEG=E3NEG+EOB3,E3NEG+DTNEGA+EOB3,E3POS+DTNEGB+EOB3,
 HVAUX3N+XDNA+CPBCPP+EOB3,
 E3NEG+CMSJCM+EOB3.
EP3POS=E3POS+EOB3,E3POS+DTPOS+EOB3,
 E3POS+DSJPOS+EOB3,
 HVAUX3+XDNB+CPBCPP+EOB3,
 HVAUX3+XD+CPBCPP+EOB3.
EQ=* =*.
EQL=EQU+POEQ.
EQU=* EQUAL TO*,* OF*.
ER=*ER*.
ERGO=XCM+XT,SEMICOL+AND+IFT.
EST=*EST*.
ETHP1=ETHR1POS+THR+XDQ+PMLA.
ETHP2=ETHR2POS+THR+XDQ+N2222QA.
ETHP3=ETHR3POS+THR+XDQ+INDEF3Q.
ETHR1POS=* IS*.
ETHR2NEG=ETHR2POS+NOT.
ETHR2POS=* ARE*.
ETHR3NEG=ETHR3POS+NOT.
ETHR3POS=* IS*.
EVERY=* EVERY*.
EXTR=VEXTR+POVEXTR.
E1NEG=E1POS+NOT.
E1POS=* IS*.
E2NEG=E2POS+NOT.
E2POS=* ARE*.
E3NEG=E3POS+NOT.
E3POS=* IS*.
FLLW=* FOLLOW*.
FORGE=VFRG+N123.
FRCN=Z+NBRMDGT+YINGDANG+NBR29.
FROM=* FROM*.
FROMRK=FROM+DFDK1+MRK.
FW=FLLW+VFXS.
G=*G*.
GAVIN=* MANY*.
HQ=VHQBAA+VHQBAB.
HQOB1=LYZMSTT1V+EQL,LYZMSTT1C+EQL.
HQOB2=INDFRA+LYZMSTT2A+EQL,INDFRAN+AV+LYZMSTT2B+EQL.
HQOB3=LYZMSTT1V+EQL,LYZMSTT1C+EQL.
HQP1=HQP1NEG,HQP1POS.
HQP1NEG=HQ1NEG+HQOB1.
HQP1POS=HQ1POS+HQOB1.
HQP2=HQP2NEG,HQP2POS.
HQP2NEG=HQ2NEG+HQOB2.
HQP2POS=HQ2POS+HQOB2.
```

```
HQ1NEG=VFIXNEG1+HQ.
HQ1POS=VHQBAA+VFXS.
HQ2NEG=VFIXNEG2+HQ.
HQ2POS=HQ.
HQ3NEG=VFIXNEG3+HQ.
HQ3POS=VHQBAA+VFXS.
HR=* HERE*.
HUM=TW,FRCN.
HYN=*-*.
IN=* IN*.
INDEF=INDFRAN+AJNP1V,INDFRA+AJNP1C.
INDFRA=* A*.
INDFRAN=* AN*.
KIRSCH=RAK+HYN+LTR,N+HYN+NBR,RAK+HYN+NBR,Z+LTR.
L=*L*.
```

```
HQP3=HQP3NEG,HQP3POS.
HQP3NEG=HQ3NEG+HQOB3.
HQP3POS=HQ3POS+HQOB3.
HQ1NEG=VFIXNEG1+HQ.
HQ1POS=VHQBAA+VFXS.
HQ2NEG=VFIXNEG2+HQ.
HQ2POS=HQ.
HQ3NEG=VFIXNEG3+HQ.
HQ3POS=VHQBAA+VFXS.
HR=* HERE*,* THERE*.
HUM=TW,FRCN.
HVAUX1=* HAS*.
HVAUX1N=HVAUX1+NOT.
HVAUX2=* HAVE*.
HVAUX2N=HVAUX2+NOT.
HVAUX3=* HAS*.
HVAUX3N=HVAUX3+NOT.
HYN=*-*.
I=*I*.
IA=* EITHER*.
IB=* OR*.
IF=* IF*.
IFF=* IF AND ONLY IF*,* IFF*.
IFT=IT+FW+THT.
IJAL=SB2,N2222Q.
IN=* IN*.
INDEF=INDFRAN+AJNP1V,INDFRA+AJNP1C.
INDEF1Q=INDFARNGA+AJNP1,INDEF.
INDEF2=INDFAR2+AJNP2.
INDEF2Q=INDFAR2Q+AJNP2.
INDEF3Q=INDFAR3Q+AJNP3.
INDFARNG=* NO*.
INDFARNGA=* ANY*.
INDFARNGB=INDFARNG,QFR2NA.
INDFARNGC=INDFARNG,QFR3NA.
INDFAR2=* *.
INDFAR2Q=* *,* ANY*,* SOME*.
INDFAR3Q=* *,* ANY*,* SOME*.
INDFRA=* A*.
INDFRAN=* AN*.
IS=* IS*.
IT=* IT*.
JA=* VERY*.
JAJC=JPC+AJ.
JAJV=JPV+AJ.
JB=* QUITE*.
JC=* SCARCELY*,* HARDLY*.
JD=* ALMOST*,* NEARLY*,* PRACTICALLY*.
JFIXLY=*LY*.
JN=* ONLY*,* JUST*.
JPC=JA+POJA,JB.
JPV=AJLGVD+JFIXLY.
KIRSCH=RAK+HYN+LTR,N+HYN+NBR,RAK+HYN+NBR,Z+LTR,Z+NBR,Z+NBR+XHYN+LTR,
 Z+LTR+XHYN+NBR.
L=*L*.
```

```
LAB=LABL+DEF111+PONLAB.
LABL=* LABEL*.
LIPKIN=N1,AJNP1.
LOC=AT+LOCX+AND+XAT+LOCY,HR.
LOCEXTR=PREFRMRK1,PREFRMRK2.
LOCX=NUM+CORX.
LOCY=NUM+CORY.
LS=* LESS*.
LT=* LEAST*.
LTR=*A*,*B*,*C*,*D*,*E*,*F*,*G*,*H*,*I*,*J*,*K*,*L*,*M*,*N*,*O*,*P*,
 *Q*,*R*,*S*,*T*,*U*,*V*,*W*,*X*,*Y*,*Z*.
LU=DERITH,GAVIN+DJUNA,PUM.
LYZ=Q,VYZPROS.
LYZAL=VLYZAL+OBVLYZAL.
LYZMST=DEFAR+XAV+LYZMSTT1.
LYZMSTT1=LYZMSTT1A,LYZMSTT1B.
LYZMSTT1A=PRNCBAG+OF+PRNCBAE,LYZMST1V,LYZMSTT1AB,LYZMSTT1AC.
LYZMSTT1AB=* COLOR*.
LYZMSTT1AC=* SIZE*.
LYZMSTT1B=AJCD+NFIX1ITY.
LYZMSTT1C=INDFRA+LYZMSTT1CC.
LYZMSTT1CC=PRPRNCBAE+PRNCBAE,PRNCBAF.
LYZMSTT1V=INDFRAN+LYZMSTT1VV.
LYZMSTT1VV=XAV+LYZMSTT1VVV,AV+LYZMSTT1CC.
LYZMSTT1VVV=LYZMST1V,PRNV11.
LYZMSTT2A=LYZMSTT2AA,LYZMSTT2AB.
LYZMSTT2AA=LYZMSTT2AAA,LYZMSTT2AAB,LYZMSTT2AAC.
LYZMSTT2AAA=RLDSBNA+NFIX1ITY.
LYZMSTT2AAB=RLDSANC+NFIX1ION.
LYZMSTT2AAC=* DISTANCE APART*.
LYZMSTT2AB=* LABEL*,* PROCESSING*.
LYZMSTT2B=LYZMSTT2AA,LYZMSTT1.
LYZMST1V=* AREA*.
LYZSPEC=VLYZA+DEF2,VLYZB+OBVLYZB,VLIST+DEF2.
M=* MATCH*.
MARK=DFDK1+MRK.
MOB1=N123+WRT1.
MOB2=N123+WRT2,XEO+WRT2.
MOB2NEG=N123NEG+WRT2,XEO+WRT2.
MOB3=N123+WRT1.
MOB3NEG=N123NEG+WRT1.
MOOF=PROXNOR,PROXQUAN.
MR=* MORE*.
MRK=* MARK*.
MRKK=VMRK+LOC.
MST=NUM1+WATT+POMU,NUM2+WATT+NFIX2S+POMU.
```

```
LAB=LABL+DEF111+PONLAB.
LABL=* LABEL*.
LIPKIN=N1,AJNP1.
LOC=AT+LOCX+AND+XAT+LOCY,HR.
LOCEXTR=PREFRMRK1,PREFRMRK2.
LOCX=NUM+CORX.
LOCY=NUM+CORY.
LS=* LESS*.
LT=* LEAST*.
LTR=*A*,*B*,*C*,*D*,*E*,*F*,*G*,*H*,*I*,*J*,*K*,*L*,*M*,*N*,*O*,*P*,
 *Q*,*R*,*S*,*T*,*U*,*V*,*W*,*X*,*Y*,*Z*.
LU=DERITH,GAVIN+DJUNA,PUM.
LYZ=Q,VYZPROS.
LYZAL=VLYZAL+OBVLYZAL.
LYZMST=DEFAR+XAV+LYZMSTT1.
LYZMSTT1=LYZMSTT1A,LYZMSTT1B.
LYZMSTT1A=PRNCBAG+OF+PRNCBAE,LYZMST1V,LYZMSTT1AB,LYZMSTT1AC.
LYZMSTT1AB=COLOR,CLRSP.
LYZMSTT1AC=* SIZE*.
LYZMSTT1B=AJCD+NFIX1ITY.
LYZMSTT1C=INDFRA+LYZMSTT1CC.
LYZMSTT1CC=PRPRNCBAE+PRNCBAE,PRNCBAF.
LYZMSTT1V=INDFRAN+LYZMSTT1VV.
LYZMSTT1VV=XAV+LYZMSTT1VVV,AV+LYZMSTT1CC.
LYZMSTT1VVV=LYZMST1V,PRNV11.
LYZMSTT2A=LYZMSTT2AA,LYZMSTT2AB.
LYZMSTT2AA=LYZMSTT2AAA,LYZMSTT2AAB,LYZMSTT2AAC.
LYZMSTT2AAA=RLDSBNA+NFIX1ITY.
LYZMSTT2AAB=RLDSANC+NFIX1ION.
LYZMSTT2AAC=* DISTANCE APART*.
LYZMSTT2AB=* LABEL*,* PROCESSING*.
LYZMSTT2B=LYZMSTT2AA,LYZMSTT1.
LYZMST1V=* AREA*.
LYZSPEC=VLYZA+DEF2,VLYZB+OBVLYZB,VLIST+DEF2.
M=* MATCH*.
MARK=DFDK1+MRK.
MAW=* AWAY*.
MOB1=N123+WRT1.
MOB2=N123+WRT2,XEO+WRT2.
MOB2NEG=N123NEG+WRT2,XEO+WRT2.
MOB3=N123+WRT1.
MOB3NEG=N123NEG+WRT1.
MOOF=PROXNOR,PROXQUAN.
MP1=MP1NEG,MP1POS.
MP1NEG=M1NEG+MOB1.
MP1POS=M1POS+MOB1.
MP2=MP2NEG,MP2POS.
MP2NEG=M2NEG+MOB2.
MP2POS=M2POS+MOB2.
MP3=MP3NEG,MP3POS.
MP3NEG=M3NEG+MOB3.
MP3POS=M3POS+MOB3.
MR=* MORE*.
MRK=* MARK*.
MRKK=VMRK+LOC.
```

```
MT=* MOST*.
MU1=WATT,BIT.
MU2=MU1+NFIX2S.
M1NEG=VFIXNEG1+M.
M1POS=M+VFXES.
M2NEG=VFIXNEG2+M.
M2POS=M.
M3NEG=VFIXNEG3+M.
M3POS=M+VFXES.
N=NVBAX1,NCBAX1.
NBR=NBR1,NBR2.
NBRT=HUM,Z+BERT.
NBRDGT=NBR29.
NBRHDRD=NBRMDGT.
NBRHDRDA=NBRMDGTA.
NBRHDRDS=NBRHDRD+NBRTENSA.
NBRHDRDSA=NBRHDRDA+NBRTENSA.
NBRMDGT=NBR1,NBR29.
NBRMDGTA=NBRZO,NBRMDGT.
NBRTEN=NBRMDGT.
NBRTENA=NBRMDGTA.
NBRTENS=NBRTEN+NBRMDGTA.
NBRTENSA=NBRTENA+NBRMDGTA.
NBRTHSNDS=NBR1+NBRHDRDSA.
NBRZO=*0*.
NBR1=*1*.
NBR2=NBRDGT,NBRTENS,NBRHDRDS,NBRTHSNDS.
NBR29=*2*,*3*,*4*,*5*,*6*,*7*,*8*,*9*.
NCBAA=NCBAAA,NCBAAB.
NCBAAA=* PROCESS*,* MASS*.
NCBAAB=NCBAABA+NFIX1EX.
NCBAABA=* CORT*.
NCBAB=NCBABA,NCBABB,NCBABC,NCBABD,NCBABE.
NCBABA=* NEURON*.
NCBABB=NCBABBA+NFIX1ER,NCBABBA+NFIX1RIL.
NCBABBA=* FIB*.
NCBABC=* CELL*.
NCBABD=NCBABDA+NFIX1E.
NCBABDA=* MEMBRAN*.
NCBABE=NCBABEA+NFIX1LE.
NCBABEA=* MUSC*,* VENTRIC*.
NCBAC=* NUCLE*,* NUCLEOL*.
NCBAD=* DENDRIT*.
NCBAE=* MICROGLIA*.
NCBAF=NCBAFA,NCBABC+NCBAFA.
NCBAFA=* BOD*.
```

```
MST=NUM1+WATT+POMU,NUM2+WATT+NFIX2S+POMU.
MT=* MOST*.
MUCH=* MUCH*.
MU1=WATT,BIT.
MU2=MU1+NFIX2S.
M1NEG=VFIXNEG1+M.
M1POS=M+VFXES.
M2NEG=VFIXNEG2+M.
M2POS=M.
M3NEG=VFIXNEG3+M.
M3POS=M+VFXES.
N=NVBAX1,NCBAX1.
NACXIT=* WHEN*,* WHENEVER*,* SINCE*,* INASMUCH AS*,* INSOFAR AS*.
NARPN2=NUM2,ARPN2.
NBAFXA=NBAFXAA+NFIX1E.
NBAFXAA=*SOM*.
NBR=NBR1,NBR2.
NBRDGT=NBR29.
NBRHDRD=NBRMDGT.
NBRHDRDA=NBRMDGTA.
NBRHDRDS=NBRHDRD+NBRTENSA.
NBRHDRDSA=NBRHDRDA+NBRTENSA.
NBRMDGT=NBR1,NBR29.
NBRMDGTA=NBRZO,NBRMDGT.
NBRT=HUM,Z+BERT.
NBRTEN=NBRMDGT.
NBRTENA=NBRMDGTA.
NBRTENS=NBRTEN+NBRMDGTA.
NBRTENSA=NBRTENA+NBRMDGTA.
NBRTHSNDS=NBR1+NBRHDRDSA.
NBRZO=*0*.
NBR1=*1*.
NBR2=NBRDGT,NBRTENS,NBRHDRDS,NBRTHSNDS.
NBR29=*2*,*3*,*4*,*5*,*6*,*7*,*8*,*9*.
NCBAA=NCBAAA,NCBAAB.
NCBAAA=* PROCESS*,* MASS*.
NCBAAB=NCBAABA+NFIX1EX.
NCBAABA=* CORT*.
NCBAB=NCBABA,NCBABB,NCBABC,NCBABD,NCBABE.
NCBABA=* NEURON*.
NCBABB=NCBABBA+NFIX1ER,NCBABBA+NFIX1RIL.
NCBABBA=* FIB*.
NCBABC=* CELL*.
NCBABD=NCBABDA+NFIX1E.
NCBABDA=* MEMBRAN*.
NCBABE=NCBABEA+NFIX1LE.
NCBABEA=* MUSC*,* VENTRIC*.
NCBAC=* NUCLE*,* NUCLEOL*.
NCBAD=* DENDRIT*.
NCBAE=* MICROGLIA*.
NCBAF=NCBAFA,NCBABC+NCBAFA.
NCBAFA=* BOD*.
NCBAG=* VACUOL*.
NCBAH=NCBAHA+NBAFXA.
NCBAHA=* KARYO*.
```

```
NCBAX1=NCBAA,NCBAB,NCBAC+NFIX1US,NCBAD+NFIX1E,
 NCBAE,NCBAF+NFIX1Y.
NCBAX2=NCBAA+NFIX2ES,NCBAB+NFIX2S,NCBAC+NFIX2I,NCBAD+NFIX1E+NFIX2S,
 NCBAE+NFIX2E,NCBAF+NFIX2IES.
NFIX1ATION=*ATION*.
NFIX1E=*E*.
NFIX1ER=*ER*.
NFIX1EX=*EX*.
NFIX1ION=*ION*.
NFIX1ITY=*ITY*.
NFIX1LE=*LE*.
NFIX1MENT=*MENT*.
NFIX1O=*O*.
NFIX1RIL=*RIL*.
NFIX1UM=*UM*.
NFIX1US=*US*.
NFIX1Y=*Y*.
NFIX2A=*A*.
NFIX2E=*E*.
NFIX2ES=*ES*.
NFIX2I=*I*.
NFIX2IES=*IES*.
NFIX2S=*S*.
NGEN1=* BLOB*.
NGEN2=NGEN1+NFIX2S.
NICON=* PICTURE*.
NNBAA=* LINE*.
NNBAB=* TRIANG*.
NNBAC=* PINCH*.
NNBAD=* ST*.
NN2=NVBAX2,NCBAX2.
NN3=NN3B,NN3A.
NN3A=NN3AA,NN3AB.
NN3AA=* NISSL SUBSTANCE*,* CHROMATIN*,* COLAGEN*,
 * MYELIN*.
NN3AB=CLR+NN3ABA,NCBAABA+NFIX1EX.
NN3ABA=* MATTER*.
NN3B=NCBAC+AJFIXO+NN3BA,CYTO+NN3BA.
NN3BA=*PLASM*.
NO=* NO*.
NON1=NON1A,NON1B,NON1C.
NON1A=NPREN11+PONPREN1.
NON1B=NPREN111+PONPREN2,N+Z+HYN+NPREN111.
```

```
NCBAX1=NCBAA,NCBAB,NCBAC+NFIX1US,NCBAD+NFIX1E,
 NCBAG+NFIX1E,NCBAH,
 NCBAE,NCBAF+NFIX1Y.
NCBAX2=NCBAA+NFIX2ES,NCBAB+NFIX2S,NCBAC+NFIX2I,NCBAD+NFIX1E+NFIX2S,
 NCBAG+NFIX2ES,NCBAH+NFIX2S,
 NCBAE+NFIX2E,NCBAF+NFIX2IES.
NFIX1AR=*AR*.
NFIX1ATION=*ATION*.
NFIX1CE=*CE*.
NFIX1E=*E*.
NFIX1ER=*ER*.
NFIX1EX=*EX*.
NFIX1ING=*ING*.
NFIX1ION=*ION*.
NFIX1ITY=*ITY*.
NFIX1LE=*LE*.
NFIX1MENT=*MENT*.
NFIX1NS=*NESS*.
NFIX1O=*O*.
NFIX1RIL=*RIL*.
NFIX1UM=*UM*.
NFIX1US=*US*.
NFIX1Y=*Y*.
NFIX2A=*A*.
NFIX2CES=*CES*.
NFIX2E=*E*.
NFIX2ERS=*ERS*.
NFIX2ES=*ES*.
NFIX2I=*I*.
NFIX2IES=*IES*.
NFIX2S=*S*.
NGEN1=* BLOB*,* OBJECT*,* THING*.
NGEN2=NGEN1+NFIX2S.
NGEN3=* MATTER*,* STUFF*,* SUBSTANCE*,* MATERIAL*.
NIA=* NEITHER*.
NIB=* NOR*.
NICON=* PICTURE*.
NNBAA=* LINE*.
NNBAB=* TRIANG*.
NNBAC=* PINCH*.
NNBAD=* ST*.
NN2=NVBAX2,NCBAX2.
NN3=NN3B,NN3A.
NN3A=NN3AA,NN3AB.
NN3AA=* NISSL SUBSTANCE*,* CHROMATIN*,* COLAGEN*,
 * MYELIN*.
NN3AB=CLR+NN3ABA,NCBAABA+NFIX1EX,NN3AC+NN3ABA.
NN3ABA=* MATTER*.
NN3AC=* PIA*.
NN3B=NCBAC+AJFIXO+NN3BA,CYTO+NN3BA.
NN3BA=*PLASM*.
NO=* NO*.
NON1=NON1A,NON1B,NON1C,NON1D.
NON1A=NPREN11+PONPREN1,AJNP11+ARGEN+NPREN11.
NON1B=NPREN111+PONPREN2,N+Z+HYN+NPREN111.
```

```
NON1C=NPREN1111+PONPREN3.
NON2=NON2A,NON2B,NON2C.
NON2A=NPREN22+PONPREN12.
NON2B=NPREN222+PONPREN2,N+Z+HYN+NPREN222.
NON2C=NPREN2222+PONPREN3.
NON3=NPREN33+PONPREN12.
NOR=DEC,FRCN.
NOT=*NT*,*N-T*,* NOT*.
NPOLAB=LIPKIN,KIRSCH.
NPREN11=PRNV1,PRNC1.
NPREN111=PRNC11,PRNV11.
NPREN1111=PRNC111.
NPREN22=PRNVBA+NFIX2S,PRNCBAA+NFIX2ES,PRNCBAB+NFIX2I.
NPREN222=PRNCBAE+NFIX2S,VARRD+NFIX2S,PRNV11A+NFIX2S,VARRB+NFIX2S.
NPREN2222=PRNCBAC+NFIX2ES,PRNCBAD+NFIX2S.
NPREN33=NN3.
NRSPT1=NRSPT1A,XNRSPT1A+NRSPT1A+AND+NRSPT1A.
NRSPT1A=LYZMSTT1,LYZMSTT2AB.
NTHH=NTHN+STROF+AJFIXTH.
NTHN=* N*.
NUM=NUM1,NUM2.
NUM1=Z+NBR1.
NUM2=Z+NBR2.
NVBAA=* ASTROCYT*.
NVBAB=* EPENDYMA*.
NVBAC=* AXON*,* ARACHNOID*,* ARTEFACT*.
NVBAD=* ENDOTHELI*.
NVBAE=NVBAEBRV,NVBAEBRV+NVBAEFUL+NFIX10.
NVBAEBRV=* OLIGO*.
NVBAEFUL=*DENDROGLI*.
NVBAX1=NVBAA+NFIX1E,NVBAB,NVBAC,
 NVBAD+NFIX1UM,NVBAE.
NVBAX2=NVBAA+NFIX1E+NFIX2S,NVBAB+NFIX2S,NVBAC+NFIX2S,
 NVBAD+NFIX2A,NVBAE+NFIX2S.
N1=N11+PO1.
N11=INDEF,DEF,PARPLU.
N111=N,NON1.
N111C=NCBAX1,PRNC1+PONPREN12.
N111V=NVBAX1,PRNV1+PONPREN12.
N123=N1,N2,N3.
N123NEG=N1,PRDN2NEG,PRDN3NEG.
N2=N2QFAR+PO2,N2CJ.
N2CJ=N2CJA+N123+AND+N123.
```

```
NON1C=NPREN1111+PONPREN3.
NON1D=NPREN111B+PONPRENN12,N+Z+HYN+NPREN111B,
 AJNP11+ARGEN+NPREN111B.
NON2=NON2A,NON2B,NON2C,NON2D.
NON2A=NPREN22+PONPREN12.
NON2B=NPREN222+PONPREN2,N+Z+HYN+NPREN222.
NON2C=NPREN2222+PONPREN3.
NON2D=NPREN222B+PONPRENN12,N+Z+HYN+NPREN222B.
NON3=NPREN33+PONPREN12.
NOR=DEC,FRCN,PRCT.
NOT=*NT*,*N-T*,* NOT*.
NPOLAB=LIPKIN,KIRSCH.
NPREN11=PRNV1,PRNC1.
NPREN111=PRNC11,PRNV11.
NPREN111B=PRNC11B,PRNV11B.
NPREN1111=PRNC111.
NPREN22=PRNVBA+NFIX2S,PRNCBAA+NFIX2ES,PRNCBAB+NFIX2I,PRNCBAN+NFIX2S,
 PRNCBAO+NFIX2ERS,PRNCBAP+NFIX2IES,PRNCBAQ+NFIX2ES,PRNCBAR+NFIX2CES.
NPREN222=PRNCBAE+NFIX2S,VARRD+NFIX2S,PRNV11A+NFIX2S,VARRB+NFIX2S,
 PRNCBAH+NFIX2S,PRNCBAI+NFIX2S,PRNCBAJ+NFIX2S,PRNCBAK+NFIX2ES,
 PRNCBAL+NFIX2S,PRNCBAM+NFIX2I.
NPREN222B=PRNC22B,PRNV22B.
NPREN2222=PRNCBAC+NFIX2ES,PRNCBAD+NFIX2S.
NPREN33=NN3.
NRSPT1=NRSPT1A,XNRSPT1A+NRSPT1A+AND+NRSPT1A.
NRSPT1A=LYZMSTT1,LYZMSTT2AB.
NTHH=NTHN+STROF+AJFIXTH.
NTHN=* N*.
NU=NUM,NUM+DECL,DEC.
NUM=NUM1,NUM2.
NUM1=Z+NBR1.
NUM2=Z+NBR2.
NVBAA=* ASTROCYT*.
NVBAB=* EPENDYMA*.
NVBAC=* AXON*,* ARACHNOID*,* ARTEFACT*.
NVBAD=* ENDOTHELI*.
NVBAE=NVBAEBRV,NVBAEBRV+NVBAEFUL+NFIX1O.
NVBAEBRV=* OLIGO*.
NVBAEFUL=*DENDROGLI*.
NVBAF=* ARTEFACT*.
NVBAX1=NVBAA+NFIX1E,NVBAB,NVBAC,
 NVBAD+NFIX1UM,NVBAE.
NVBAX2=NVBAA+NFIX1E+NFIX2S,NVBAB+NFIX2S,NVBAC+NFIX2S,
 NVBAD+NFIX2A,NVBAE+NFIX2S.
N1=N11+PO1.
N11=INDEF,DEF,PARPLU.
N111=N,NON1.
N111C=NCBAX1,PRNC1+PONPREN12.
N111V=NVBAX1,PRNV1+PONPREN12.
N1111=INDEF,NUM1+AJNP1.
N1111NG=INDFARNG+AJNP1.
N123=N1,N2,N3.
N123NEG=N1,PRDN2NEG,PRDN3NEG.
N2=N2QFAR+PO2,N2CJ.
N2CJ=N2CJA+N123+AND+N123.
```

```
N2CJA=X,X,X,X,N2CJA+N123+CM.
N2CJANEG=X,X,X,X,N2CJANEG+N123NEG+CM.
N2CJNEG=N2CJANEG+N123NEG+ANDOR+N123NEG.
N2QFAR=QFAR+AJNP2.
N222=NN2,NON2.
N3=N33+PO3.
N33=QFAR3+AJNP3.
N333=NN3,NON3.
OBAWAY=N123,MARK.
OBVCALL=DEF111,DEF2.
OBVLYZAL=ALL+NGEN2.
OBVLYZB=OBVLYZB1,OBVLYZB2.
OBVLYZB1=LYZMST+OF+DEF111.
OBVLYZB2=DEFAR+XAV+LYZMSTT2B+OF+DEF2,LYZMST+OF+DEF11.
OF=* OF*.
PARNTHEQ=PRNL+NTHN+EQ+NBR2+PRNR.
PARPLU=NUM1+OF+DFDK2+AJNP2.
PART=MRKK,XTR,MRKK+CM+XTR.
PICALL=ALPC+LOCEXTR.
PICSPEC=ALL+DEF2.
POAJ=X,X,ANDOR+ADJ3.
POEQ=MST,POEQN.
POEQN=THOF+N123.
POEXTR=X,CM+WHOLE.
POMU=IN+WOPOMU.
PONLAB=XWTL+DND.
PONPREN1=X,OF+N1.
PONPREN12=PONPREN1,PONPREN2.
PONPREN2=X,OF+N2.
PONPREN3=X,OF+AJNP3.
PORLV=X,X,X,AND+RLV+PORLV.
```

```
N2CJA=X,X,X,X,N2CJA+N123+CM.
N2CJANEG=X,X,X,X,N2CJANEG+N123NEG+CM.
N2CJNEG=N2CJANEG+N123NEG+ANDOR+N123NEG,IA+N123NEG+IB+N123NEG.
N2CJNEGA=NIA+N2+NIB+N2.
N2QFAR=QFAR+AJNP2,PARPLU2.
N2QFARNEG=N2222NG,N2CJNEGA.
N222=NN2,NON2.
N2222=INDEF2,NUM2+AJNP2.
N2222A=INDFARNGA+AJNP2.
N2222NG=INDFARNGB+AJNP2,QFR2NG+DEF2.
N2222Q=INDEF2Q,PARPLUQA.
N2222QA=QFARQ+AJNP2.
N3=N33+PO3.
N33=QFAR3+AJNP3.
N333=NN3,NON3.
N333A=INDFARNGA+AJNP3.
N333NG=INDFARNGC+AJNP3,QFR3NG+DEF3.
N8=ARINV+N88.
N88=* FACT*.
OBAWAY=N123,MARK.
OBVCALL=DEF111,DEF2.
OBVLYZAL=ALL+NGEN2.
OBVLYZB=OBVLYZB1,OBVLYZB2.
OBVLYZB1=LYZMST+OF+DEF111.
OBVLYZB2=DEFAR+XAV+LYZMSTT2B+OF+DEF2,LYZMST+OF+DEF11.
OF=* OF*.
OGRE=XCM+CJBECK.
PARNTHEQ=PRNL+NTHN+EQ+NBR2+PRNR.
PARPLU=NUM1+OF+DFDK2+AJNP2,ARPN1+OF+DFDK2+AJNP2.
PARPLUQA=ARPN2Q+OF+DFDK2+AJNP2.
PARPLUQB=PARPLUQBA,PARPLUQBB.
PARPLUQBA=QQFR2A+OF+DFDK2+AJNP2.
PARPLUQBB=QQFRWHA+OF+DFDK2+AJNP2.
PARPLU2=NARPN2+OF+DFDK2+AJNP2.
PART=MRKK,XTR,MRKK+CM+XTR.
PICALL=ALPC+LOCEXTR.
PICSPEC=ALL+DEF2.
PMLA=N1111,INDEF1Q.
POAJ=X,X,ANDOR+ADJ3.
POCJ=X,X,X,CJJ+STT.
POEQ=MST,POEQN.
POEQN=THOF+N123.
POEXTR=X,CM+WHOLE.
POJA=X,X,X,POJAA.
POJAA=XCM+JA+POJA.
POMU=IN+WOPOMU.
PONLAB=XWTL+DND.
PONPRENN1=OF+N1.
PONPRENN12=PONPRENN1,PONPRENN2.
PONPRENN2=OF+N2.
PONPREN1=X,OF+N1.
PONPREN12=PONPREN1,PONPREN2.
PONPREN2=X,OF+N2.
PONPREN3=X,OF+AJNP3.
PORLV=X,X,X,AND+RLV+PORLV.
```

```
POSYNN=AND+VPOSYNN.
POVEXTR=PICALL,PICSPEC.
POVVLISTA=X,PVLSTA.
POVVLISTB=X,PVLSTB.
PO1=X,X,X,X,X,X,X,PO11.
PO11=WHCL1,WHCL1+AND+PO11.
PO2=X,X,X,X,X,X,X,PO22.
PO22=WHCL2,WHCL2+AND+PO22.
PO3=X,X,X,X,X,X,X,PO33.
PO33=WHCL3,WHCL3+AND+PO33.
PRDN2=PRDN2QFAR+PO2,N2CJ.
PRDN2NEG=PRDN2QFNEG+PO2,N2CJNEG.
PRDN2QFAR=PRDQFAR+AJNP2.
PRDN2QFNEG=PRDQFARNEG+AJNP2.
PRDN3=PRDN33+PO3.
PRDN3NEG=PRDN33NEG+PO3.
PRDN33=PRDQFAR3+AJNP3.
PRDN33NEG=PRDQFAR3NEG+AJNP3.
PRDQFAR=PRDQFR,NUM2,DFDK2.
PRDQFARNEG=PRDQFRNEG,NUM2,DFDK2.
PRDQFAR3=PRDQFR,ARPREAR3.
PRDQFAR3NEG=PRDQFRNEG,ARPREAR3.
PRDQFR=* *,* SOME*.
PRDQFRNEG=* *,* ANY*.
PREAR=X,PREAR3.
PREAR3=MOOF+OF.
PRED1=PRED1NEG,PRED1POS.
PRED1NEG=EP1NEG,VP1NEG,AJP1NEG,RELP1NEG.
PRED1POS=EP1POS,VP1POS,AJP1POS,RELP1POS.
PRED2=PRED2NEG,PRED2POS.
PRED2NEG=EP2NEG,VP2NEG,AJP2NEG,RELP2NEG.
PRED2POS=EP2POS,VP2POS,AJP2POS,RELP2POS.
PRED3=PRED3NEG,PRED3POS.
PRED3NEG=EP3NEG,VP3NEG,AJP3NEG,RELP3NEG.
PRED3POS=EP3POS,VP3POS,AJP3POS,RELP3POS.
PREFRMRK1=NUM1+BIT+FROMRK.
PREFRMRK2=NUM2+BIT+NFIX2S+FROMRK.
PREPDIR=* AT*,* TO*,* TOWARD*.
PRNCBAA=* PROCESS*.
PRNCBAB=* NUCLE*,* NUCLEOL*.
PRNCBAC=* GRANUL*.
PRNCBAD=* FLAKE*.
PRNCBAE=* PERIMETER*.
PRNCBAF=* COLOR*,* SIZE*,* SHAPE*.
PRNCBAG=* LENGTH*,* WIDTH*,* HEIGHT*.
PRNCBAH=* NETWORK*.
```

```
POSYNN=AND+VPOSYNN.
POVEXTR=PICALL,PICSPEC.
POVVLISTA=X,PVLSTA.
POVVLISTB=X,PVLSTB.
PO1=X,X,X,X,X,X,X,PO11.
PO11=WHCL1,WHCL1+AND+PO11.
PO2=X,X,X,X,X,X,X,PO22.
PO22=WHCL2,WHCL2+AND+PO22.
PO3=X,X,X,X,X,X,X,PO33.
PO33=WHCL3,WHCL3+AND+PO33.
PPVBC=* BECOME*.
PPVRM=VRM+VFXED.
PRCNT=* O/O*,* PERCENT*,* PER CENT*.
PRCT=NU+PRCNT.
PRDN2=PRDN2QFAR+PO2,N2CJ.
PRDN2NEG=PRDN2QFNEG+PO2,N2CJNEG.
PRDN2QFAR=PRDQFAR+AJNP2.
PRDN2QFNEG=PRDQFARNEG+AJNP2.
PRDN3=PRDN33+PO3.
PRDN3NEG=PRDN33NEG+PO3.
PRDN33=PRDQFAR3+AJNP3.
PRDN33NEG=PRDQFAR3NEG+AJNP3.
PRDQFAR=PRDQFR,NUM2,DFDK2.
PRDQFARNEG=PRDQFRNEG,NUM2,DFDK2.
PRDQFAR3=PRDQFR,ARPREAR3.
PRDQFAR3NEG=PRDQFRNEG,ARPREAR3.
PRDQFR=* *,* SOME*.
PRDQFRNEG=* *,* ANY*.
PREAR=X,PREAR3.
PREAR3=MOOF+OF.
PRED1=PRED1NEG,PRED1POS.
PRED1NEG=EP1NEG,VP1NEG,AJP1NEG,RELP1NEG.
PRED1POS=EP1POS,VP1POS,AJP1POS,RELP1POS.
PRED2=PRED2NEG,PRED2POS.
PRED2NEG=EP2NEG,VP2NEG,AJP2NEG,RELP2NEG.
PRED2POS=EP2POS,VP2POS,AJP2POS,RELP2POS.
PRED3=PRED3NEG,PRED3POS.
PRED3NEG=EP3NEG,VP3NEG,AJP3NEG,RELP3NEG.
PRED3POS=EP3POS,VP3POS,AJP3POS,RELP3POS.
PREFRMRK1=NUM1+BIT+FROMRK.
PREFRMRK2=NUM2+BIT+NFIX2S+FROMRK.
PREPDIR=* AT*,* TO*,* TOWARD*.
PREPDIRA=* AT*,* TOWARD*.
PRNCBAA=* PROCESS*.
PRNCBAB=* NUCLE*,* NUCLEOL*.
PRNCBAC=* GRANUL*.
PRNCBAD=* FLAKE*.
PRNCBAE=* PERIMETER*.
PRNCBAF=* COLOR*,* SIZE*,* SHAPE*.
PRNCBAG=* LENGTH*,* WIDTH*,* HEIGHT*.
PRNCBAH=* NETWORK*.
PRNCBAI=VG,VG+NFIX1ING.
PRNCBAJ=* LAYER*,* ZONE*.
PRNCBAK=* MASS*.
PRNCBAL=* COLUMN*.
```

```
PRNC1=PRNCBAA,PRNCBAB+NFIX1US.
PRNC11=PRNCBAH,VARRD.
PRNC111=PRNCBAD,PRNCBAC+NFIX1E.
PRNL=* (*.
PRNR=* )*.
PRNVBA=* AXON*.
PRNV1=PRNVBA.
PRNV11=PRNV11A,PRNV11B.
PRNV11A=VARRA+NFIX1MENT,VARRC+NFIX1ATION.
PRNV11B=VARRB.
PRON1=* THIS*.
PRON2= * THESE*.
PRON3=* THIS*.
PROSS=WHOLE,PART.
PROX=X,X,X,ABT.
PROXNOR=PROX+Z+NOR.
PROXQUAN=* MOST*,* ALL*,* SOME*,* NONE*.
PRPRNCBAE=X,PRNCBAG+OF.
PRT=INDFRA+PRTT.
PRTT=* PART*.
PT=*.*.
PTT=*.*.
PUM=* MUCH*.
PVLSTA=* IN SEQUENCE*,* IN ORDER*,* IN ALPHABETICAL ORDER*.
PVLSTB=EVERY+NTHH+UNO+PARNTHEQ+OF.
Q=QQ+PT.
QFAR=QFR,NUM2,DFDK2.
QFAR3=QFR,ARPREAR3.
QFR=* *,* SOME*,* ALL*.
```

```
PRNCBAM=* NUKLE*,* NUCLE*.
PRNCBAN=* CAP*,* FROND*,* SATELLITE*.
PRNCBAO=* CENT*.
PRNCBAP=* PERIPHER*.
PRNCBAQ=* POL*,* STRUCTUR*.
PRNCBAR=* SPA*.
PRNCBAS=* SHAPE*.
PRNCBAU=* STRUCTUR*.
PRNC1=PRNCBAA,PRNCBAB+NFIX1US,PRNCBAN,PRNCBAO+NFIX1ER,
 PRNCBAP+NFIX1Y,PRNCBAQ+NFIX1E,PRNCBAR+NFIX1CE.
PRNC11=PRNCBAH,VARRD,PRNCBAI,PRNCBAJ,PRNCBAK,PRNCBAL,
 PRNCBAU+NFIX1E,
 PRNCBAM+NFIX1US.
PRNC11B=PRNCBAS.
PRNC111=PRNCBAD,PRNCBAC+NFIX1E.
PRNC22B=PRNCBAS+NFIX2S.
PRNL=* (*.
PRNR=* )*.
PRNVBA=* AXON*.
PRNVBAA=* AREA*.
PRNV1=PRNVBA,PRNVBAA.
PRNV11=PRNV11A,PRNV11B.
PRNV11A=VARRA+NFIX1MENT,VARRC+NFIX1ATION.
PRNV11B=VARRB,PRNVBAA.
PRNV22B=PRNVBAA+NFIX2S.
PRONP1=DKAR1+ADJ+NGEN1.
PRONP2=DKAR2+ADJ+NGEN2.
PRONP3=DKAR3+ADJ3+NGEN3.
PRON1=THIS,THAT,PRONP1.
PRON2=THESE,THOSE,PRONP2.
PRON3=THIS,THAT,PRONP3.
PROSS=WHOLE,PART.
PROX=X,X,X,ABT.
PROXNOR=PROX+Z+NOR.
PROXQUAN=* MOST*,* ALL*,* SOME*,* NONE*.
PRPRNCBAE=X,PRNCBAG+OF.
PRT=INDFRA+PRTT.
PRTT=* PART*.
PSFS=CLCE,CLCN,CLCS,CLCW.
PT=*.*.
PTT=*.*.
PUM=MUCH,JA+MUCH.
PVLSTA=* IN SEQUENCE*,* IN ORDER*,* IN ALPHABETICAL ORDER*.
PVLSTB=EVERY+NTHH+UNO+PARNTHEQ+OF.
Q=QQ+PT.
QFAR=QFR,NUM2,DFDK2,QFR2A.
QFARQ=QFRQ,NUM2.
QFAR3=QFR,ARPREAR3.
QFN3=QFN3A,QFN3B.
QFN3A=* PART*.
QFN3B=* CLUMP*,* AREA*.
QFR=* *,* SOME*,* ALL*.
QFRQ=QFR,INDFARNGA.
QFR2=QFR2A,QFR2B,QFR2C,QFR2D,QFR2E.
QFR2A=* MOST*,* MANY*,* SEVERAL*.
```

```
QQ=Q1,Q2,Q3.
Q1=Q1EP,Q1VP,Q1AJP,Q1RELP,Q1MP,Q1HQP.
Q1AJP=EEE1POS+SB1+AJOB.
Q1EP=E1POS+SB1+EOB1.
Q1HQP=VAUX1+SB1+HQ+HQOB1.
Q1MP=VAUX1+SB1+M+MOB1.
Q1RELP=EE1POS+SB1+RELOB1.
Q1VP=VAUX1+SB1+V+VOB1.
Q2=Q2EP,Q2VP,Q2AJP,Q2RELP,Q2MP,Q2HQP.
Q2AJP=EEE2POS+SB2+AJOB.
Q2EP=E2POS+SB2+EOB2.
```

```
QFR2B=* SOME*.
QFR2BQ=* ANY*.
QFR2C=* A NUMBER*.
QFR2D=* A FEW*.
QFR2E=* A SMALL NUMBER*.
QFR2NA=JN+QFR2ND,XJA+QFR2NB.
QFR2NB=* FEW*.
QFR2NC=* NONE*.
QFR2ND=QFR2D,QFR2E.
QFR2NG=QFR22NG+OF.
QFR22NG=QFR2NA,XJD+QFR2NC.
QFR3NA=XJN+QFR3ND.
QFR3NB=XJN+QFR3NC.
QFR3NC=* A SMALL AMOUNT*.
QFR3ND=* A LITTLE*.
QFR3NG=QFR33NG+OF.
QFR33NG=QFR3NA,QFR3NB.
QQ=Q1,Q2,Q3,RSVP.
QQFRWH=QQFRWHA,QQFRWHB.
QQFRWHA=* WHICH*.
QQFRWHB=* WHAT*.
QQFR2=QQFR2A,QQFRWH.
QQFR2A=* HOW MANY*.
QQFR3=QQFR3A,QQFR3B.
QQFR3A=* HOW MUCH*.
QQFR3B=QQFRWH+QFN3.
Q1=Q1EP,Q1VP,Q1AJP,Q1RELP,Q1MP,Q1HQP,Q1QFR.
Q1AJP=EEE1POS+SB1+AJOB,EEE1POS+SB1+DQ+AJOB,
 EEE1POS+INDEF1Q+XDQ+AJOB,
 ETHP1+WHCL1XA,
 HVAUX1+TDAP+XDQ+CPBCPP+AJOBAM.
Q1EP=E1POS+SB1+EOB1,E1POS+SB1+DQ+EOB1,
 E1POS+INDEF1Q+XDQ+EOB1,
 ETHP1+WHEP1,
 HVAUX1+TDAP+XDQ+CPBCPP+EOB1.
Q1HQP=VAUX1+SB1+HQ+HQOB1,VAUX1+SB1+DQ+HQ+HQOB1,
 ETHP1+WHHQP1,
 VAUX1+INDEF1Q+XDQ+HQ+HQOB1.
Q1MP=VAUX1+SB1+M+MOB1,VAUX1+SB1+DQ+M+MOB1,
 VAUX1+INDEF1Q+XDQ+M+MOB1,
 ETHP1+WHMP1.
Q1Q=QQFRWH+AJNP1.
Q1QFR=Q1Q+PRED1.
Q1RELP=EE1POS+SB1+RELOB1,EE1POS+SB1+DQ+RELOB1,
 EE1POS+INDEF1Q+XDQ+RELOB1,
 ETHP1+WHCL1XB.
Q1VP=VAUX1+SB1+V+VOB1,VAUX1+SB1+DQ+V+VOB1,
 VAUX1+INDEF1Q+XDQ+V+VOB1,
 ETHP1+WHV1.
Q2=Q2EP,Q2VP,Q2AJP,Q2RELP,Q2MP,Q2HQP,Q2QFR.
Q2AJP=EEE2POS+SB2+AJOB,EEE2POS+SB2+DQ+AJOB,
 EEE2POS+N2222Q+XDQ+AJOB,
 ETHP2+WHCL2XA,
 HVAUX2+IJAL+XDQ+CPBCPP+AJOBAM.
Q2EP=E2POS+SB2+EOB2,E2POS+SB2+DQ+EOB2,
```

```
Q2HQP=VAUX2+SB2+HQ+HQOB2.
Q2MP=VAUX2+SB2+M+MOB2.
Q2RELP=EE2POS+SB2+RELOB2.
Q2VP=VAUX2+SB2+V+VOB2.
Q3=Q3EP,Q3VP,Q3AJP,Q3RELP,Q3MP,Q3HQP.
Q3AJP=EEE3POS+SB3+AJ3OB.
Q3EP=E3POS+SB3+EOB3.
Q3HQP=VAUX3+SB3+HQ+HQOB3.
Q3MP=VAUX3+SB3+M+MOB3.
Q3RELP=EE3POS+SB3+RELOB3.
Q3VP=VAUX3+SB3+V+VOB3.
RAK=* RAK*.
RE=* WITH REGARD TO*.
REL=RLV+PORLV,RLVD.
RELOB1=REL+N123.
RELOB2=REL+N123,RLVI+N2.
RELOB3=REL+N123.
RELP1NEG=EE1NEG+RELOB1.
```

```
 FTHP2+WHEP2,
 HVAUX2+IJAL+XDQ+CPBCPP+EOB2,
 E2POS+N2222Q+XDQ+EOB2.
Q2HQP=VAUX2+SB2+HQ+HQOB2,VAUX2+SB2+DQ+HQ+HQOB2,
 ETHP2+WHHQP2,
 VAUX2+N2222Q+XDQ+HQ+HQOB2.
Q2MP=VAUX2+SB2+M+MOB2,VAUX2+SB2+DQ+M+MOB2,
 ETHP2+WHMP2,
 VAUX2+N2222Q+XDQ+M+MOB2.
Q2Q=QQFR2+AJNP2,PARPLUQB.
Q2QFR=Q2Q+PRED2.
Q2RELP=EE2POS+SB2+RELOB2,EE2POS+SB2+DQ+RELOB2,
 ETHP2+WHCL2XB,
 EE2POS+N2222Q+XDQ+RELOB2.
Q2VP=VAUX2+SB2+V+VOB2,VAUX2+SB2+DQ+V+VOB2,
 ETHP2+WHV2,
 VAUX2+N2222Q+XDQ+V+VOB2.
Q3=Q3EP,Q3VP,Q3AJP,Q3RELP,Q3MP,Q3HQP,Q3QFR.
Q3AJP=EEE3POS+SB3+AJ3OB,EEE3POS+SB3+DQ+AJ3OB,
 EEE3POS+INDEF3Q+XDQ+AJ3OB,
 ETHP3+WHCL3XA,
 HVAUX3+TCLP+XDQ+CPBCPP+AJ3OBAM.
Q3EP=E3POS+SB3+EOB3,E3POS+SB3+DQ+EOB3,
 E3POS+INDEF3Q+XDQ+EOB3,
 ETHP3+WHEP3,
 HVAUX3+TCLP+XDQ+CPBCPP+EOB3.
Q3HQP=VAUX3+SB3+HQ+HQOB3,VAUX3+SB3+DQ+HQ+HQOB3,
 ETHP3+WHHQP3,
 VAUX3+INDEF3Q+XDQ+HQ+HQOB3.
Q3MP=VAUX3+SB3+M+MOB3,VAUX3+SB3+DQ+M+MOB3,
 ETHP3+WHMP3,
 VAUX3+INDEF3Q+XDQ+M+MOB3.
Q3Q=QQFR3+OF+DFDK3+AJNP3.
Q3QFR=Q3Q+PRED3.
Q3RELP=EE3POS+SB3+RELOB3,EE3POS+SB3+DQ+RELOB3,
 ETHP3+WHCL3XB,
 EE3POS+INDEF3Q+XDQ+RELOB3.
Q3VP=VAUX3+SB3+V+VOB3,VAUX3+SB3+DQ+V+VOB3,
 ETHP3+WHV3,
 VAUX3+INDEF3Q+XDQ+V+VOB3.
RAK=* RAK*,* NIH*.
RE=* WITH REGARD TO*,* WITH RESPECT TO*.
REL=RLV+PORLV,RLVD.
RELAB=RELABC,RELABV,RLVACSPAB,RLVBA.
RELABC=RLVACAGNC,RLDS,XVPLC.
RELABV=RLVAAE+RLVAAF,XVPLV.
RELAB1=RELAB1C,RELAB1V,RLVACSPAB,RLVBA.
RELAB1C=RLVACAGNC,XVPLC.
RELAB1V=RELABV.
RELOBA=REL+N123,REL+MARK.
RELOB1=REL+N123,REL+MARK,RELAB1+XN123.
RELOB2=REL+N123,RLVI+N2,REL+MARK,RELAB+XN123.
RELOB22=RLVI+N2,RELOBA.
RELOB3=REL+N123,REL+MARK,RELAB+XN123.
RELP1NEG=EE1NEG+RELOB1,EE1NEG+DTNEGA+RELOB1,EE1POS+DTNEGB+RELOB1,
```

```
RELP1POS=EE1POS+RELOB1.
RELP2NEG=EE2NEG+RELOB2.
RELP2POS=EE2POS+RELOB2.
RELP3NEG=EE3NEG+RELOB3.
RELP3POS=EE3POS+RELOB3.
RLDS=RLDSA,RLDSB.
RLDSA=RLDSANA+AP,RLDSANB+AJFIXED,RLDSANC+AJFIXE,RLDSANC+AJFIXED.
RLDSANA=* FAR*.
RLDSANAA=RLDSANA,RLDSAND.
RLDSANACPV=RLDSANAA+AJFIXTHER.
RLDSANB=* DISPERS*.
RLDSANC=* SEPARAT*.
RLDSAND=* FUR*.
RLDSB=RLDSBNA+AJFIXE.
RLDSBNA=* DENC*.
RLDSCPV=RLDSANACPV+AP,RLDSBNA+ER,MR+RLDSANB+AJFIXED,
 MR+RLDSANC+AJFIXE,LS+RLDSANB+AJFIXED,LS+RLDSANC+AJFIXE.
RLV=RLVA,RLVB,RLVC,RLVE,RLVF,RLVG,
 RLVH.
RLVA=RLVAA,RLVAB,RLVAC.
RLVAA=RLVAAA+RLVAAB,RLVAAC+RLVAAD.
RLVAAA=* IN*.
RLVAAB=X,RLVAAD.
RLVAAC=* OUT*.
RLVAAD=*SIDE*,*SIDE OF*.
RLVAB=VEDA+IN,VEDB+BY,VEIV+OF,PRT+OF.
RLVAC=RLVACA,RLVACB.
RLVACA=RLVACAGN,RLVACSP.
RLVACAGN=RLVACAGNA,RLVACAGNB.
RLVACAGNA=* NEXT TO*,* NEAR*,* TANGENT TO*.
RLVACAGNB=VTCH+AJFIXING.
RLVACB=RLVACBGN,RLVACSP.
RLVACBGN=RLDSANA+AWAY.
RLVACSP=RLVDIRN,RLVDIRE,RLVDIRS,RLVDIRW.
RLVB=RLVB1,RLVB2.
RLVB1=DERITH1+AWAY.
RLVB2=DERITH2+AWAY.
RLVC=CPV+THAN.
RLVD=BU+RLDSANACPV+AWAY+OBAWAY+THAN+FROM.
RLVDIRE=RLVDIREGN,RLVDIRESP.
RLVDIREGN=* TO THE RIGHT OF*.
RLVDIRESP=PREPDIR+CLCE+CLC+FROM.
RLVDIRN=RLVDIRNGN,RLVDIRNSP.
RLVDIRNGN=* ABOVE*,* OVER*.
RLVDIRNSP=PREPDIR+CLCN+CLC+FROM.
```

```
 EE1NEG+CMSJCM+RELOB1.
RELP1POS=EE1POS+RELOB1,EE1POS+DTPOS+RELOB1,EE1POS+DSJPOS+RELOB1.
RELP2NEG=EE2NEG+RELOB2,EE2NEG+DTNEGA+RELOB2,EE2POS+DTNEGB+RELOB2,
 EE2NEG+CMSJCM+RELOB2.
RELP2POS=EE2POS+RELOB2,EE2POS+DTPOS+RELOB2,EE2POS+DSJPOS+RELOB2.
RELP3NEG=EE3NEG+RELOB3,EE3NEG+DTNEGA+RELOB3,
 EE3POS+DTNEGB+RELOB3,EE3NEG+CMSJCM+RELOB3.
RELP3POS=EE3POS+RELOB3,EE3POS+DTPOS+RELOB3,EE3POS+DSJPOS+RELOB3.
RGO=* ERGO*.
RLDS=RLDSA,RLDSB.
RLDSA=RLDSANA+AP,RLDSANA+MAW,RLDSANB+AJFIXED,
 RLDSANC+AJFIXE,RLDSANC+AJFIXED.
RLDSANA=* FAR*.
RLDSANAA=RLDSANA,RLDSAND.
RLDSANACPV=RLDSANAA+AJFIXTHER.
RLDSANB=* DISPERS*.
RLDSANC=* SEPARAT*.
RLDSAND=* FUR*.
RLDSB=RLDSBNA+AJFIXE.
RLDSBNA=* DENC*.
RLDSCPV=RLDSANACPV+AP,RLDSBNA+ER,MR+RLDSANB+AJFIXED,
 MR+RLDSANC+AJFIXE,LS+RLDSANB+AJFIXED,LS+RLDSANC+AJFIXE.
RLV=RLVA,RLVB,RLVC,RLVE,RLVF,RLVG,
 RLVH.
RLVA=RLVAA,RLVAB,RLVAC.
RLVAA=RLVAAA+RLVAAB,RLVAAC+RLVAAD.
RLVAAA=* IN*.
RLVAAB=X,RLVAAD.
RLVAAC=* OUT*.
RLVAAD=*SIDE*,*SIDE OF*.
RLVAAE=RLVAAA,RLVAAC.
RLVAAF=*SIDE*.
RLVAB=VEDA+IN,VEDB+BY,VEIV+OF,PRT+OF.
RLVAC=RLVACA,RLVACB.
RLVACA=RLVACAGN,RLVACSP.
RLVACAGN=RLVACAGNA,RLVACAGNB.
RLVACAGNA=* NEXT TO*,* NEAR*,* TANGENT TO*.
RLVACAGNB=VTCH+AJFIXING.
RLVACAGNC=* NEARBY*,* TANGENT*.
RLVACB=RLVACBGN,RLVACSP.
RLVACBGN=RLDSANA+AWAY.
RLVACSP=RLVDIRN,RLVDIRE,RLVDIRS,RLVDIRW.
RLVACSPAB=SCYLLA,CHARYBDIS.
RLVB=RLVB1,RLVB2.
RLVBA=DERITH+MAW.
RLVB1=DERITH1+AWAY.
RLVB2=DERITH2+AWAY.
RLVC=CPV+THAN.
RLVD=BU+RLDSANACPV+AWAY+OBAWAY+THAN+FROM.
RLVDIRE=RLVDIREGN,RLVDIRESP.
RLVDIREGN=* TO THE RIGHT OF*.
RLVDIRESP=PREPDIR+CLCE+CLC+FROM.
RLVDIRN=RLVDIRNGN,RLVDIRNSP.
RLVDIRNGN=* ABOVE*,* OVER*.
RLVDIRNSP=PREPDIR+CLCN+CLC+FROM.
```

```
RLVDIRS=RLVDIRSGN,RLVDIRSSP.
RLVDIRSGN=* BELOW*,* UNDER*,* UNDERNEATH*.
RLVDIRSSP=PREPDIR+CLCS+CLC+FROM.
RLVDIRW=RLVDIRWGN,RLVDIRWSP.
RLVDIRWGN=* TO THE LEFT OF*.
RLVDIRWSP=PREPDIR+CLCW+CLC+FROM.
RLVE=AS+AJNCT+AS.
RLVF=NBRT+AS+AJNCT+AS.
RLVG=AJREL+FROM.
RLVH=* COMPOSED OF*,* ANALYZABLE INTO*,* BASED ON*,* DERIVED FROM*.
RLVI=AS+RLDS+AS,RLDSCPV+THAN.
RSPT1=XAV+NRSPT1.
RSPT2=RSPT1,LYZMSTT2AA.
SB1=PRON1,N1.
SB2=PRON2,N2.
SB3=PRON3,N3.
SPQP=RLVAAA,RLVAAC.
```

```
RLVDIRS=RLVDIRSGN,RLVDIRSSP.
RLVDIRSGN=* BELOW*,* UNDER*,* UNDERNEATH*.
RLVDIRSSP=PREPDIR+CLCS+CLC+FROM.
RLVDIRW=RLVDIRWGN,RLVDIRWSP.
RLVDIRWGN=* TO THE LEFT OF*.
RLVDIRWSP=PREPDIR+CLCW+CLC+FROM.
RLVE=AS+AJNCT+AS.
RLVF=NBRT+AS+AJNCT+AS.
RLVG=AJREL+FROM.
RLVH=* COMPOSED OF*,* ANALYZABLE INTO*,* BASED ON*,* DERIVED FROM*.
RLVI=AS+RLDS+AS,RLDSCPV+THAN.
RSPT1=XAV+NRSPT1.
RSPT2=RSPT1,LYZMSTT2AA.
RSVP=IS+IT+XDQ+SAJJD+THT+STTTT.
SAJD=SAJDB+DFXLY,SAJDA,SAJDC+DFXY,SAJDD+DFXLY,SAJDE+DFXLY.
SAJDA=* DOUBTLESS*.
SAJDB=* CLEAR*,* CERTAIN*,* PLAIN*,* OBVIOUS*,* EVIDENT*,* MANIFEST*.
SAJDC=* INDISPUTABL*.
SAJDD=* UNDOUBTED*.
SAJDE=* TRU*.
SAJJD=SAJDB,SAJDC+AJFIXE,SAJDE+AJFIXE.
SAJS=SAJSA.
SAJSA=IT+IS+XD+SAJJD+THT.
SB1=PRON1,N1.
SB1NEG=N1111NG+PO1.
SB2=PRON2,N2.
SB2NEG=N2QFARNEG+PO2.
SB3=PRON3,N3.
SB3NEG=N333NG+PO3.
SCHUYLKILL=CM+SJSJ.
SCJA=SCJAA,SCJAB.
SCJAA=SCJAAA,SCJAAB,SCJAAC,SCJAAF.
SCJAAA=* STILL*.
SCJAAB=* OF COURSE*,* AT ANY RATE*,* IN ANY CASE*.
SCJAAC=SCJAAD,SCJAAD+SCJAAA.
SCJAAD=* BUT*.
SCJAAE=* HOWEVER*.
SCJAAF=* NEVERTHELESS*.
SCJAB=SCJAAA,SCJAAE.
SCJB=XSCJA+SAJSA,THS+IS+SCJJ,THS+IS+SOW+CJBEC.
SCJJ=CJBECAA,CJBECB.
SCYLLA=XIPE+TOTEC,TSPS.
SEMICOL=*/, *.
SJ=SCJA+XCM,SAJD+XCM,SAJS,SCJB.
SJSJ=SJSJSJ,SCJAAB,SCJAAE.
SJSJSJ=SCJAAA,SCJAAF.
SOA=* SO*.
SOW=SOA,SAJDE+AJFIXE.
SPQR=RLVAAA,RLVAAC.
STCMPD=IF+STMT+CJPLYA+STMT,
 NACXIT+STMT+CM+STMT,
 IFF+STMT+CJPLYC+STMT,
 STMT+ERGO+STMT,
 STMT+OGRE+STMT,
 STMT+CJCM+STMT,
```

```
STMT=STTPOS,STTNEG.
STROF=*-*.
STTNEG=STTNEG1,STTNEG2,STTNEG3.
STTNEG1=SB1+PRED1NEG.
STTNEG2=SB2+PRED2NEG.
STTNEG3=SB3+PRED3NEG.
STTPOS=STTPOS1,STTPOS2,STTPOS3.
STTPOS1=SB1+PRED1POS.
STTPOS2=SB2+PRED2POS.
STTPOS3=SB3+PRED3POS.
STTT=STMT+PT.
SYN=SYNN+POSYNN.
SYNN=CALL,PROSS,FORGE.
TH=*TH*.
THAN=* THAN*.
THOF=* THAT OF*.
TW=* TWICE*.
UNO=* ONE*.
V=VH,VCN.
VARRA=* ARRANGE*,* ALIGN*.
VARRB=* ARRAY*.
VARRC=* ORIENT*.
VARRD=* POSITION*.
VAUX1=DO+VFXES.
```

```
 XCJEO+STMT+CJEOA+STMT,
 STMT+XCM+UXMAL+STMT,
 CJBECK+STMT+CM+STMT.
STMT=STTPOS,STTNEG.
STMTCJ=STCMPD+POCJ.
STMTSJ=SJ+STTTT,STTTT+SCHUYLKILL.
STROF=*-*.
STT=STMT,STMTCJ.
STTNEG=STTNEG1,STTNEG2,STTNEG3.
STTNEG1=SB1+PRED1NEG,THR+ETHR1POS+N1111NG+WHCL1X,SB1NEG+PRED1POS,
 SB1+CMSJCM+PRED1NEG,SB1NEG+CMSJCM+PRED1POS.
STTNEG2=SB2+PRED2NEG,THR+ETHR2POS+N2222NG+WHCL2X,
 SB2+CMSJCM+PRED2NEG,SB2NEG+CMSJCM+PRED2POS,
 THR+ETHR2NEG+N2222A+WHCL2X,SB2NEG+PRED2POS.
STTNEG3=SB3+PRED3NEG,THR+ETHR3POS+N333NG+WHCL3X,
 SB3+CMSJCM+PRED3NEG,SB3NEG+CMSJCM+PRED3POS,
 THR+ETHR3NEG+N333A+WHCL3X,SB3NEG+PRED3POS.
STTPOS=STTPOS1,STTPOS2,STTPOS3.
STTPOS1=SB1+PRED1POS,THR+ETHR1POS+N1111+WHCL1X,
 SB1+CMJJCM+PRED1POS.
STTPOS2=SB2+PRED2POS,THR+ETHR2POS+N2222+WHCL2X,
 SB2+CMJJCM+PRED2POS.
STTPOS3=SB3+PRED3POS,THR+ETHR3POS+N333+WHCL3X,
 SB3+CMJJCM+PRED3POS.
STTT=STMT+PT,STMTCJ+PT,STMTSJ+PT.
STTTT=STMT,STMTCJ.
SUR=* ON*.
SYN=SYNN+POSYNN.
SYNN=CALL,PROSS,FORGE.
TCLP=INDEF3Q,SB3.
TDAP=SB1,INDEF1Q.
TH=*TH*.
THAN=* THAN*.
THAT=* THAT*.
THENN=* THEN AND ONLY THEN*,* THENN*.
THESE=* THESE*.
THIS=* THIS*.
THOF=* THAT OF*.
THOSE=* THOSE*.
THR=* THERE*.
THRFR=* THEREFORE*,* THUS*.
THS=* THIS*.
THT=* THAT*.
TOTEC=ARINV+AJLGRLV.
TSPS=* ABOVE*,* BELOW*,* UNDERNEATH*.
TW=* TWICE*.
UAXACTUN=AJDTPOSB+DFXLY.
UNO=* ONE*.
UXMAL=IF,NACXIT,IFF.
V=VH,VCN,VINCL,VINCR,VEMBR,VHD,VPS,VBL+YTO.
VARRA=* ARRANGE*,* ALIGN*.
VARRB=* ARRAY*.
VARRC=* ORIENT*.
VARRD=* POSITION*.
VAUX1=DO+VFXES.
```

```
VAUX2=DO.
VAUX3=DO+VFXES.
VCALL=* CALL UP*.
VEXTR=* EXTRACT*.
VCN=* CONTAIN*.
VEDA=VCN+AJFIXED,VINCL+AJFIXD.
VEDB=VNTRSCT+AJFIXED.
VEIV=VINCLBAB+AJFIXIVE.
VFIXE=*E*.
VFXES=*ES*.
VFIXNEG1=VAUX1+NOT.
VFIXNEG2=VAUX2+NOT.
VFIXNEG3=VAUX3+NOT.
VFXS=*S*.
VFRG=* DRAW*,* DIAGRAM*,* CAJAL*.
VH=VHBAA+VHBAB.
VHBAA=* HA*.
VHBAB=*VE*.
VHQBAA=* HA*.
VHQBAB=*VE*.
VINCL=VINCLBAA+VFIXE.
VINCLBAA=VINCLBAAA+VINCLBAAB.
VINCLBAAA=* INCLU*.
VINCLBAAB=*D*.
VINCLBAB=VINCLBAAA+VINCLBABB.
VINCLBABB=*S*.
VLIST=VVLIST+POVVLISTA+POVVLISTB.
VLYZA=* COUNT*.
VLYZAL=VLYZA.VLYZB+LYZMST+OF.
VLYZB=* FIND*.
VMARK=* PLACE*.
VMRK=VMARK+INDFRA+MRK.
VNTRSCT=* INTERSECT*.
VOB1=PRON1,N1.
VOB2=PRON2,PRDN2.
VOB2NEG=PRON2,PRDN2NEG.
VOB3=PRON3,PRDN3.
VOB3NEG=PRON3,PRDN3NEG.
VPOSYNN=* DISPLAY*,* STORE*,* HOLD*.
VPSVFXED=*ED*.
VP1NEG=V1NEG+VOB1,M1NEG+MOB1,HQ1NEG+HQOB1.
```

```
VAUX2=DO.
VAUX3=DO+VFXES.
VBL=* BELONG*.
VCALL=* CALL UP*.
VCN=* CONTAIN*.
VEDA=VCN+AJFIXED,VINCL+AJFIXD.
VEDB=VNTRSCT+AJFIXED.
VEIV=VINCLBAB+AJFIXIVE.
VEMBR=VEMBRBA+VFIXE.
VEMBRBA=* EMBRAC*.
VEXTR=* EXTRACT*.
VFIXE=*E*.
VFIXNEG1=VAUX1+NOT.
VFIXNEG2=VAUX2+NOT.
VFIXNEG3=VAUX3+NOT.
VFRG=* DRAW*,* DIAGRAM*,* CAJAL*.
VFXED=*ED*.
VFXES=*ES*.
VFXS=*S*.
VG=* GROUP*.
VH=VHBAA+VHBAB.
VHBAA=* HA*.
VHBAB=*VE*.
VHD=* HOLD*.
VHQBAA=* HA*.
VHQBAB=*VE*.
VINCL=VINCLBAA+VFIXE.
VINCLBAA=VINCLBAAA+VINCLBAAB.
VINCLBAAA=* INCLU*.
VINCLBAAB=*D*.
VINCLBAB=VINCLBAAA+VINCLBABB.
VINCLBABB=*S*.
VINCR=VINCRBA+VFIXE.
VINCRBA=* INCORPORAT*.
VLIST=VVLIST+POVVLISTA+POVVLISTB.
VLYZA=* COUNT*.
VLYZAL=VLYZA,VLYZB+LYZMST+OF.
VLYZB=* FIND*.
VMARK=* PLACE*,* PUT*.
VMRK=VMARK+INDFRA+MRK.
VNTRSCT=* INTERSECT*.
VOB1=PRON1,N1.
VOB2=PRON2,PRDN2.
VOB2NEG=PRON2,PRDN2NEG.
VOB3=PRON3,PRDN3.
VOB3NEG=PRON3,PRDN3NEG.
VPLC=VCN+AJFIXED.
VPLV=VINCL+AJFIXD,VEDB.
VPLVING=VNTRSCT+AJFIXING,VEIV+XOB.
VPOSYNN=* DISPLAY*,* STORE*,* HOLD*.
VPS=* POSSESS*.
VPSVFXED=*ED*.
VP1=VP1N,VP1P.
VP1N=V1NEG+VOB1.
VP1NEG=V1NEG+VOB1,M1NEG+MOB1,HQ1NEG+HQOB1.
```

```
VP1POS=V1POS+VOB1,M1POS+MOB1,HQ1POS+HQOB1.
VP2NEG=V2NEG+VOB2NEG,M2NEG+MOB2NEG,HQ2NEG+HQOB2.
VP2POS=V2POS+VOB2,M2POS+MOB2,HQ2POS+HQOB2.
VP3NEG=V3NEG+VOB3NEG,M3NEG+MOB3NEG,HQ3NEG+HQOB3.
VP3POS=V3POS+VOB3,M3POS+MOB3,HQ3POS+HQOB3.
VTCH=* TOUCH*.
VVLIST=VVVLIST,VLYZA+AND+VVVLIST.
VVVLIST=* LIST*.
VYZPROS=LYZAL,LYZSPEC.
V1NEG=VFIXNEG1+V.
V1POS=VHBAA+VFXS,VCN+VFXS.
V2NEG=VFIXNEG2+V.
V2POS=VH,VCN.
V3NEG=VFIXNEG3+V.
V3POS=VHBAA+VFXS,VCN+VFXS.
WATT=* MICRON*.
WH=* WHICH*.
WHCL1=WH+PRED1.
WHCL2=WH+PRED2.
WHCL3=WH+PRED3.
```

```
VP1P=V1POS+VOB1.
VP1POS=V1POS+VOB1,M1POS+MOB1,HQ1POS+HQOB1.
VP2=VP2N,VP2P.
VP2N=V2NEG+VOB2.
VP2NEG=V2NEG+VOB2NEG,M2NEG+MOB2NEG,HQ2NEG+HQOB2.
VP2P=V2POS+VOB2.
VP2POS=V2POS+VOB2,M2POS+MOB2,HQ2POS+HQOB2.
VP3=VP3N,VP3P.
VP3N=V3NEG+VOB3.
VP3NEG=V3NEG+VOB3NEG,M3NEG+MOB3NEG,HQ3NEG+HQOB3.
VP3P=V3POS+VOB3.
VP3POS=V3POS+VOB3,M3POS+MOB3,HQ3POS+HQOB3.
VRM=* REMAIN*.* STAY*.
VTCH=* TOUCH*.
VVLIST=VVVLIST,VLYZA+AND+VVVLIST.
VVVLIST=* LIST*.
VVYBA=*VAR*.
VYZPROS=LYZAL,LYZSPEC.
V1NEG=VFIXNEG1+V.
V1POS=VHBAA+VFXS,VCN+VFXS,VINCL+VFXS,VINCR+VFXS,VEMBR+VFXS,
 VHD+VFXS,VPS+VFXES,VBL+VFXS+YTO.
V2NEG=VFIXNEG2+V.
V2POS=VH,VCN,VINCL,VINCR,VEMBR,VHD,VPS,VBL+YTO.
V3NEG=VFIXNEG3+V.
V3POS=VHBAA+VFXS,VCN+VFXS,VINCL+VFXS,VINCR+VFXS,VEMBR+VFXS,
 VHD+VFXS,VPS+VFXES,VBL+VFXS+YTO.
WATT=* MICRON*.
WH=* WHICH*.
WHCLAJP1NEG=WH+AJP1NEG.
WHCLAJP1POS=WH+AJP1POS.
WHCLAJP2NEG=WH+AJP2NEG.
WHCLAJP2POS=WH+AJP2POS.
WHCLAJP3NEG=WH+AJP3NEG.
WHCLAJP3POS=WH+AJP3POS.
WHCLRELP1NG=WH+EE1NEG+RELOB1.
WHCLRELP1PS=WH+EE1POS+RELOB1.
WHCLRELP2NG=WH+EE2NEG+RELOB2.
WHCLRELP2PS=WH+EE2POS+RELOB2.
WHCLRELP3NG=WH+EE3NEG+RELOB3.
WHCLRELP3PS=WH+EE3POS+RELOB3.
WHCL1=WH+PRED1.
WHCL1X=WHCL1,MST,LOC,RELOBA.
WHCL1XA=MST,LOC,WHCLAJP1POS,WHCLAJP1NEG.
WHCL1XB=RELOB1.WHCLRELP1PS,WHCLRELP1NG.
WHCL2=WH+PRED2.
WHCL2X=WHCL2,MST,LOC,RELOB22.
WHCL2XA=MST,LOC,WHCLAJP2POS.WHCLAJP2NEG.
WHCL2XB=RELOB2,WHCLRELP2PS,WHCLRELP2NG.
WHCL3=WH+PRED3.
WHCL3X=WHCL3,MST,LOC,RELOBA.
WHCL3XA=MST,LOC,WHCLAJP3POS,WHCLAJP3NEG.
WHCL3XB=RELOB3,WHCLRELP3PS,WHCLRELP3NG.
WHEP1=WH+EP1.
WHEP2=WH+EP2.
WHEP3=WH+EP3.
```

```
WHOLE=* ENLARGE*,* CUSTER*,* TWIST*,* SHRINK*.
WITH=* WITH*.
WMW=* CANT ANSWER*.
WOPOMU=PRNCBAE,PRNCBAG.
WRT1=RE+RSPT1.
WRT2=RE+RSPT2.
X=* *.
XAS=X,AS.
XAT=X,AT.
XAV=X,AV.
XEO=X,X,X,EO.
XNRSPT1A=X,X,X,X,NRSPT1A+CM.
XSTTNEG=X,CM+STTNEG.
XSTTPOS=X,CM+STTPOS.
XTR=EXTR+POEXTR.
XWTL=X,WITH+DEFAR+LABL.
YES=* YES*.
YINGDANG=*/*.
YN=YES+XSTTPOS,NO+XSTTNEG,WMW.
```

```
WHHQP1=WH+HQP1.
WHHQP2=WH+HQP2.
WHHQP3=WH+HQP3.
WHMP1=WH+MP1.
WHMP2=WH+MP2.
WHMP3=WH+MP3.
WHN=* WHENCE*,* HENCE*.
WHOLE=* ENLARGE*,* CUSTER*,* TWIST*,* SHRINK*,* REDUCE*,
 * SKETCH*,
 * DARKEN*,* LIGHTEN*,* GRID*,* DEGRID*,* HEIGHTEN*.
WHV1=WH+VP1.
WHV2=WH+VP2.
WHV3=WH+VP3.
WITH=* WITH*.
WMW=* CANT ANSWER*,* PLEASE REPHRASE*.
WOPOMU=PRNCBAE,PRNCBAG.
WRT1=RE+RSPT1.
WRT2=RE+RSPT2.
X=* *.
XANADU=XAND+SOA+XIFT,WHN+XIFT.
XAND=X,AND.
XAS=X,AS.
XAT=X,AT.
XAV=X,AV.
XCJEO=X,CJEO.
XCM=X,CM.
XCMJJXCM=CM+DTPOSB+CM,DTPOSB.
XD=X,X,X,X,DTPOS.
XDNA=X,DTNEGA.
XDNB=X,DTNEGB.
XDQ=X,X,DQ.
XEO=X,X,X,EO.
XHYN=X,HYN.
XIFT=X,IFT.
XIPE=PREPDIR,SUR.
XIU=CLR,AJCAAA,AJCAB,AJCB.
XJA=X,JA.
XJD=X,JD.
XJN=X,JN.
XNRSPT1A=X,X.X,X,NRSPT1A+CM.
XN123=* *.
XOB=* *.
XSB=* *.
XSCJA=X,SCJA+XCM.
XSTMTCJ=X,SEMICOL+STMTCJ.
XSTTNEG=X,CM+STTNEG.
XSTTPOS=X,CM+STTPOS.
XT=XANADU,THRFR.
XTR=EXTR+POEXTR.
XVPLC=VPLC+XSB.
XVPLV=VPLV+XSB,VPLVING.
XWTL=X,WITH+DEFAR+LABL.
YES=* YES*.
YINGDANG=*/*.
YN=YES+XSTTPOS,YES+XSTMTCJ,NO+XSTTNEG,NO+XSTMTCJ,WMW.
```

PLACEBO IV

```
Z=* *.
```

PLACEBO V

```
YTO=* TO*.
Z=* *.
```

2. Inclusion Properties Between Context-Free Grammars: Sketch.[10]

Noam Chomsky has defined 'equivalence' properties as these may obtain for a pair of grammars. Informally, two grammars "...will be called weakly equivalent if they generate the same language; they will be called strongly equivalent if they generate the same set of structural descriptions."[11] These notions of equivalence have inspired my present interest in notions of inclusion between two grammars. In this paper, except where noted otherwise, I will state inclusion properties only for Context-Free Grammars (CFG), as defined by Chomsky[12], for only such grammars are my concern here. Moreover, I will present these properties in a rather informal style. At a later time I expect to treat of inclusion properties more broadly and more formally.

As in PLACEBO IV and V, I will use the symbol "=" in place of the 'Chomsky Arrow', a "...finite, two-place, irreflexive and asymmetric relation defined on certain strings..."[13]; this symbol may be read, as Chomsky suggests, as "is rewritten as" or, equivalently, as "is instantiated as". I will use the symbol "+" in place of the concatenation symbol "⌢"; "+", then, is "...an associative and non-commutative ...operation on strings..."[13] (I have adopted these two notational conventions only for reasons of typing convenience.)

I will generally define inclusion relations between CFG as obtaining on an abstractive plane above that of the terminal or non-terminal symbols used by the individual grammars: that is, one grammar

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10 B.K.Rankin III, R.A.Kirsch, and R.W.Hsu must receive some credit for whatever accuracies may be found in this section.

11 Noam Chomsky, "Introduction to the Formal Analysis of Natural Languages," in: Handbook of Mathematical Psychology, edited by R.L. Luce, R.R.Bush, and E.Galanter; Volume II, pp.269-321. The quoted passage is on p.297.

12 Ibid., pp.292ff. CFG are often called "simple phrase-structure" grammars.

13 Chomsky, loc.cit.

may in my usage include another (in one or another way) even though the including and included grammars share no symbols. From this point of view, structurally-isomorphic grammars or languages are identical: they are simply "realphabetizations" each of the other. A grammar (or grammar sub-part) 'X' will be said to be a "realphabetization" of another grammar (or subpart) 'Y' if an isomorphism can be stated for 'X' and 'Y' such that every rule in 'X' is matched by a rule in 'Y', and vice-versa, where one rule "matches" another if there is a one-to-one mapping, symbol for symbol and connective for connective, of the one onto the other; and where no symbols or connectives not identical in 'A' are identical in 'B', and vice-versa. Here, a "symbol" is a symbol of the terminal or nonterminal vocabulary; a "connective" is "=" or "+".

Hereafter when I speak of a grammar 'B' being included in some grammar 'A' in some way, I will mean "'B' is included or some realphabetization of 'B' is included" unless otherwise specified.

2.1. Strong Inclusion.

A grammar 'B' will be said to be strongly included in a grammar 'A' if the set of rules comprising 'B' is a proper subset of the set of rules comprising 'A'.

In the exemplificatory grammars which follow (where symbols from the terminal vocabulary are given in lower-case), both 'B' and 'C' are strongly-included in 'A':

'A'	'B'	'C'
Q = R	Q = R	L = M
R = S	R = S	M = N
R = T	S = u	N = p
S = u		
T = v		

Note that it is only for convenience, in these grammars, that I mark symbols of the terminal vocabulary in any way; for any instance-symbol which never occurs as an instantiator (i.e. on the left side of "=") is a terminal symbol. Thus, grammar 'D' is also strongly included in 'A':

'D'
Q = R R = S

2.2. Weak Inclusion.

A grammar 'B' will be said to be weakly included in some grammar 'A' if the set of strings generated by 'B' is a proper subset of the set of strings generated by 'A'

In the above examples, 'B', 'C', and 'D' are all weakly included in 'A'.

2.3. Relations between Strong and Weak Inclusion.

'B' may be strongly included in 'A' but yet not weakly included; 'B' may be weakly included in 'A' but not strongly included. Thus, strong and weak inclusion are independent of each other.

'A'	'B'
Q = R + R R = s	R = s

The rules of grammar 'B' are a proper subset of the rules of grammar'A'; however grammar 'A' generates only the string "ss", while 'B' generates only the string "s". So 'B', while strongly included in 'A', is not weakly included.

'A'	'B'
Q = R + s	Q = R + W
Q = t	R = u
R = u + v	W = v + s

Grammar 'A' generates the two strings "uvs" and "t"; grammar 'B' generates the string "uvs". However, it is not true that the set of rules comprising 'B' is a proper subset of the rules comprising 'A'; thus 'B', though weakly included, is not strongly included in 'A'.

There are one or two peculiar relations between strong and weak inclusion which, even in this rather narrow treatment, deserve mention. One relation is this: there are context-free languages which necessarily have non-context-free languages as proper subsets: thus there are cases of two grammars 'A' and 'B' where 'B' is necessarily weakly included in 'A' but cannot be strongly included (where we insist that both be CFG). For, as Chomsky has pointed out,[14] the language consisting of all and only the strings ($a^n b^n a^m$) is context-free; while the language ($a^n b^n a^m$ / n=m) is not context free.[15] But the latter (generated by 'B') is a proper subset of the former (generated by 'A'), and in fact there is no CFG 'A' which does not generate the language 'B'. Then 'B' must be weakly-included in 'A', but cannot be strongly-included in 'A'.

A second peculiarity may be exemplified by these same 'A' and 'B' grammars. Of course, for some subsets of 'B' there can be devised CFG; let us select one of these languages and call it 'Bα'. But all of the strings generated by 'Bα' are also generated by any CFG 'A'. Then there can be no CFG which unambiguously strongly includes any CFG for the language 'Bα' and the language 'A'.

2.4. Thorough Inclusion.

A slightly more useful notion of inclusion is provided by what I

14 Op.cit., p.380.
15 Ibid., p.367.

will call "thorough inclusion."

A grammar 'B' will be said to be thoroughly-included in some grammar 'A' if the set of sentences (≠ 'set of strings') generated by 'B' is a proper subset of the set of sentences generated by 'A'.

My distinction between string and sentence appears to be close to the distinction between "sentence" and "sentoid" made recently by Katz and Postal.[16] A string is a sequence of terminal symbols regardless of what description it receives; while a sentence is such a string with a unique structural description associated with (= imposed on) it. Thus a sentence is syntactically univocal -- displays no constructional homonymity -- while a string may be ambiguous, with respect to a particular grammar which generates it, in that the same grammar may also generate another string, isomorphic with the first, with a different (non-identical) set of rules.

I would add only one additional note to this presentation. One may also consider cases where grammars, in generating strings, impose on them no structural description (sd) at all. Such cases of what we might call "constructional anonymity" have little interest on their own account, though they may involve pragmatic considerations of greater weight. A constructionally-anonymous string may have an ancillary property of "pseudoambiguity": when the string is given (as it generally is) as just a sequence of terminal symbols, without intervening concatenation symbols, it may not be possible even to partition the string into its proper terminals, if e.g. "d", "e", and "de" are, all three, possible terminal symbols. Pseudoambiguity can be circumvented easily enough in exemplificatory grammars, but it can pose a real problem to programs for recognizing written English, where the presented terminal strings contain only spaces (rather than concatenative symbols) between words.

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16 J.J.Katz and P.M.Postal, An Integrated Theory of Linguistic Descriptions (=Research Monograph #26), The M.I.T. Press, Cambridge, Mass., 1964; xi,178 pp. See also J.F.Staal's review: Foundations of Language 1.133-154 (1965).

2.5. Relations among Thorough, Strong, and Weak Inclusions.

It is clear that 'B' can be both strongly and weakly included in 'A' without being thoroughly included.

'A'	'B'
R = S+S = D+c S = a+b+c D = a+b	S = a+b+c

'A' generates the strings "abc" and "abcabc"; 'B' generates "abc". The rule in 'B' is included among those of 'A'. Yet 'B' and 'A' generate their common string "abc" in quite different ways: so 'B', while both strongly and weakly, is yet not thoroughly included in 'A'.

On the other hand, if 'B' is thoroughly included in 'A', then its sentences are included; then its strings are included: so then 'B' is also weakly included in 'A'. But if 'B' imposes on this set of strings the same set of sd as is imposed by 'A', it must do so by the same set of rules: so 'B' must be strongly, as well as weakly, included in 'A', if thoroughly included. Note especially that it is definitely not enough for each sentence in 'B' to be individually isomorphic to some sentence in 'A': the two sets must be isomorphic. I will not bother to here, but it is quite easy to devise two grammars 'A' and 'B' such that each one of the sentences of 'B' is matched isomorphically by a sentence in 'A', but where the sets of sentences of the two grammars, due to failure to preserve realphabetizational symbol-identity, are not isomorphic.

2.6. Comment on Thorough Inclusion.

From the informal definitions given above, it is plain that it would be relatively easy to devise a grammar for a large subset of all

e.g. French sentences, which would be thoroughly included in some grammar for a large subset of the set of all English sentences. In fact, since PLACEBO IV is thoroughly included in PLACEBO V, it is possible to "reterminalize" PLACEBO IV so that all lexical items are French ones---the resulting generations are largely gibberish, to be sure---where the product of such an operation is thoroughly included in PLACEBO V. More seriously, both "French PLACEBO IV" and the English PLACEBO V could be altered here and there, perhaps exclusively at the penterminal level, so that the French microgrammar generated well-formed French sentences, PLACEBO V generated only well-formed English sentences, and PLACEBO V still thoroughly included PLACEBO IV. Or, if this could not quite be done, two other large microgrammars might be constructed so as to be related in this way. The relation "thorough inclusion", then, may apply to some useful cross-language limited natural-language systems, such as workers in Mechanical Translation may come to be interested in.

2.7. Radical Inclusion.

We will say that a grammar 'B' is radically included in some grammar 'A' if 'B' is thoroughly included in 'A' and sentences structurally isomorphic in 'A' and 'B' are formally identical.

That is, the sentences in the two grammars which have identical analyses and which are manifested as equivalent strings (identical except for realphabetization),are identical in form (are not realphabetizations).

This last is a slightly more trenchant notion than those preceding: for example, PLACEBO IV is radically included in PLACEBO V.[17] This is also a somewhat more practical notion, in that in practice -- technical "undecideability" aside -- it should be easier to determine whether two grammars are related by radical inclusion than to determine whether they are related merely by thorough inclusion. The generation by 'B' of one string not identical in form to some string generated by 'A', suffices to rule out the radical inclusion of 'B' in 'A'.

Since radical inclusion subsumes and presupposes thorough inclu-

17 Checked manually.

sion, all remarks made above about the relations between thorough inclusion on the one hand, and weak and strong inclusions on the other, apply mutatis mutandis for radical inclusion.

Note, lastly, that the radical inclusion of 'B' in 'A' can never disambiguate 'B'; for inclusion can only preserve, compound, or create ambiguity: never reduce it.

2.8. Manubrial Inclusion.

We will say that a grammar 'B' is manubrially included in some grammar 'A' if 'B' is radically included and every pair of structurally-isomorphic symbols from 'A' and 'B', contains only symbols identical in form.

Manubrial inclusion is of course the notion of least linguistic interest, since from the point of view of Language the formal identity of nonterminal symbols is of no consequence whatever, except perhaps in some peripheral way (e.g. if the symbol-names are themselves to be analyzed). But on the other hand manubrial inclusion is by far the most practical notion advanced in these pages, since it is much the easiest to test for; no elaborate algorithm need be pursued to ferret out every possibility of realphabetization. For example, it is known that PLACEBO IV is radically included in PLACEBO V only because IV is manubrially included in V.

Since all linguistic interest resides in radical inclusion, rather than in manubrial inclusion, all of the following remarks on the particulars of IV's inclusion in V, will deal with radical inclusion only.

2.9. PLACEBO IV's Radical Inclusion within PLACEBO V.

Now, after much ado about setting the scene, we consider the effects of insisting that PLACEBO IV be radically included in PLACEBO V.

2.9.1. Why Bother?

It must be obvious, with no further discussion, that it would be far easier to "base" PLACEBO V on IV in some relaxed way than to build it so as to radically include IV. For the more rigorous demand is

tantamount to requiring that the microgrammarian never bury his mistakes ---or even, as architects do, cover them with ivy. Every misguided or shortsighted decision made earlier, will be preserved; and will in many cases be exposed more glaringly and be more troublesome. In which case, it is reasonable to ask why anyone should take the trouble.

The answer is that a very real practical benefit can ensue. For the writing of large microgrammars, where "large" equals 1,000 rules and up, is a tedious and rather time-consuming affair; to build a 5,000-8,000 rule microgrammar may take one or two years. If this microgrammar is being constructed for some use or other -- say for an artificial intelligence system -- then the microgrammar will be but one of several components, ideally all being developed concurrently toward the common end. Yet if any of those components must be made to "serve" or "be served by" the microgrammar, such a component cannot be started till the microgrammar is completed, unless some thought is given to concurrent development. Clearly this microgrammar-bound component will be worthless if it is developed for a microgrammar-fragment which is superseded as the microgrammar is expanded: either wholly superseded or superseded only partially but in a haphazard manner. For concurrent development of mutually-dependent components, all of the matched parts must be incorporated into matched wholes; each microgrammar must be radically included in the next one. Or close to it, at least: the exceptions to the preservation of radical inclusion must be few enough to be conveniently kept track of.

In the aforementioned ITSELF artificial-intelligence system the last PLACEBO will be tied to at least one other component, in all probability: this is the algorithm which translates PLACEBO-analyzed sentences into machine-instructions and the like. Another PLACEBO-bound component will be the "iconic microgrammar" discussed briefly in Lipkin, Watt, and Kirsch, op.cit. It is imperative that such components be begun relatively early-on: imperative, then, that there can be built partial components for PLACEBO IV which can be incorporated into larger partial components (or be of service unchanged) for PLACEBO V, e.g.

2.9.2. The Risk of Ambiguity.

The primary risk run in radically including one microgrammar in another, is of course that in the process of so doing unwanted ambiguities may creep in. This danger is widely recognized among computational linguists, to such an extent in fact that it has been suggested that radical inclusion is in the main an impractical goal. Yet I think it unlikely that any microgrammar and its generated language will be such that a desired including language will demand a microgrammar which, if it is to include the smaller algorithm, must necessarily be ambiguous. So that the problem is not formal but pragmatic: and insuring against spurious ambiguity merely entails extensive watchfulness.

However, a successful attempt to avoid unwanted ambiguities may have a secondary effect: the including microgrammar may have to go to such lengths to avoid some ambiguities that its list of rules is artificially increased, and greatly so. We might justly call this phenomenon one of "inflation"; and assuredly PLACEBO V is "inflated" in this sense.

Let us pass to an example.

On page 36, above, the following rule may be found:

Q1RELP = EE1POS + SB1 + RELOB1.

On the facing page 37, we find the PLACEBO V expansion of this rule:

Q1RELP = EE1POS + SB1 + RELOB1 , EE1POS + SB1 + DQ + RELOB1 ,
EE1POS + INDEF1Q + XDQ + RELOB1 , ETHP1 + WHCL1XB.

The first segment of the PL/V rule simply preserves the whole of the corresponding PL/IV rule. The second segment preserves the same PL/IV rule, but adds a new element: "DQ". The third segment preserves some of the PL/IV rule, but adds an element "XDQ", while substituting "INDEF1Q" for "SB1". The fourth segment is wholly new.

The symbol "EE1POS" instantiates immediately as "is";"SB1" will eventually instantiate as a noun or as a pronoun: "this", "that", or "this/that/the (±ADJECTIVE) thing". "RELOB1" instantiates eventually as one of a large set of RELative OBjects, e.g. "next to the ____".

"DQ" will instantiate as one of the adverbs that can occur (in this position) in a question. But "XDQ" instantiates either as "DQ" or as "X"; and "X", the "overt deletion penterminal", in effect deletes this node entirely, so that entering the "XDQ" node is equivalent to being presented with a choice between continuing into "DQ" or halting. Any rule "A=B+XDQ+C", then, is equivalent in effect to the two rules "A=B+C" and "A=B+DQ+C". This "X-rule" method of compressing two rules into one, where the two rules differ only in that one includes an extra symbol, has been used in part of the "Q1RELP" rule cited above, i.e. in the instance "EE1POS+INDEF1Q+XDQ+RELOB1". Thus the symbol "XDQ" has been brought into being, to serve wherever either the presence or absence of "DQ" is allowable. Yet "XDQ" cannot be used throughout the "Q1RELP" rule for this purpose. The absence of "DQ" has already been taken care of in the string brought (forcibly) over from PLACEBO IV -- "EE1POS+SB1+RELOB1". If now the next string in this (PL/V) rule were given as "EE1POS+SB1+XDQ+RELOB1" -- which seems reasonable enough in light of the previously-cited use of "XDQ" -- then all of the "EE1POS+SB1+...+RELOB1" eventual strings (i.e. omitting any "DQ") would have two derivations: one from the "X" choice offered by "XDQ"; one from the absence of any "DQ"-instantiating symbol in the three-symbol string. Since such an ambiguity is intolerable, the "Q1RELP" rule must be given as cited, with two instanced strings included where one "XDQ"-containing instanced string would, if PLACEBO IV had not intruded, have done as well. It is just such considerations as this which "inflate" an including microgrammar.

It is not always so easy to forestall ambiguities of the kind just discussed; in the final analysis they are best guarded against by constant recourse to mechanical parsing of submitted sentences: the ambiguities thus diagnosed can be struck out as discovered. I do not yet have a practical mechanical parser for the PLACEBO microgrammars, so it would be foolish of me to claim that PLACEBO V has no unwanted ambiguities built into it.

2.10. A Practical Alternative to Radical Inclusion.

In view of the disadvantages of radical inclusion strictly construed, an alternative proposal might be welcome: a proposed method of letting work on microgrammar-bound programs proceed concurrently, with its future usefulness guaranteed, while freeing the microgrammarian from the constraints of radical inclusion. From what has been said above, it is clear that this "guarantee" and this "freedom" can only be relative; a compromise with radical inclusion, then, will be acceptable only to the extent that the microgrammarian's coworkers show themselves willing to redo some portion of their work. "Partial radical inclusion" -- the informal property being discussed here -- must be part of a 'social contract'; I see no hope at present of defining it very exactly, or of predicting the scope of coworkers' tolerance.

In any case, PLACEBO V will only be partially radically-included in PLACEBO VI (now a-building); we will see whether anything can be learned from this experience; and if learned, communicated.

3. Sentences from Random Production.

A microgrammar may or may not have "closure" with respect to some natural language, e.g. English. A microgrammar which is completely closed in this sense generates only sentences of e.g. English, all with their correct structural descriptions. Now, it has been said many times[18] that English is beyond the strong generative capacity of the Context-Free model: but obviously there are subsets of English which are within CF strong generative capacity;[19] and there are even larger subsets of English which are clearly within CF weak generative capacity. Thus there may be built CF microgrammars which are closed with respect to English. If in this regard we distinguish between "strong" and "weak" closure -- the meaning of which terms is obvious in the present context -- then we may say that there may be built microgrammars which are both weakly and strongly closed.

18 See e.g. Chomsky, op.cit., pp.297 ff.
19 Ibid.

PLACEBO V generates many terminal strings whose assigned structural descriptions would rightly be labeled inadequate with respect to any acceptable full-scale grammar of English. (Prenominal adjectival strings are an example of such inadequacy)[20]. Thus, this microgrammar plainly falls short of strong closure. The case for weak closure is often harder to make out, for here we run afoul of the question of grammaticality: what terminal (printed) strings are so grossly malformed that no assigned structural description can make them into English sentences? Generally, PLACEBO V is much closer to achieving weak closure than to achieving strong closure -- this is hardly surprising -- ; but there are many "borderline" strings generated by this microgrammar, and some which to me seem to overstep the border into ungrammaticality. Such a string as:

"Are there always any neurons near the astrocyte?"

seems clearly beyond the pale, due to the requirement in English that strongly-positive questions (e.g. any question containing "always") employ "some" instead of "any".[21] Yet it is far easier to let PL/V generate a large set of questions containing "always", nearly all of which are well-formed, than to make it generate all of that set less the few which are malformed. So that PLACEBO V has been left somewhat short of complete weak closure.[22]

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20 Chomsky takes up the similar problem of coordinated predicate adjectives on pp. 298-9, op.cit.

The question of whether the artificial-intelligence deictic situation can compensate for lack of strong closure, will be taken up in a later paper.

21 Of course this is far from a complete description of the named effect.

22 It is my hope -- it may be a vain one -- that the sentences actually submitted to any artificial intelligence device using PLACEBO V will be largely such as to receive correct structural descriptions, perhaps in a less-than-global meaning of "correct". (That is, they may be acceptable in the limited context though still not exactly the sd one would want a "quasi-complete" grammar to assign.) For example, prenominal adjectival strings containing only two adjectives are more correctly analyzed than are such strings containing three or more adjectives. It may be possible, moreover, to construct a limited context-sensitive device to peruse context-free analyses and improve them where needed.

Generative closure is most easily gaged by examining the results of computer-production from the rules of the microgrammar. A "random generation" routine (more properly, "random production") for producing sentences from grammatical rules has been amply described by Yngve[23]; and a particular such routine, as applied to PLACEBO IV, has also been described.[24] That same routine, as adapted for larger microgrammars by R. W. Hsu[25], has been used to produce the sentences from PLACEBO V which follow on the next few pages, each with its accompanying "trace" of generation. These "traces" show how the sentence in view is generated from the rules of PLACEBO V -- i.e. how the computer produced the sentence --; working through four or five of these "traces", for anyone who has the patience, is the easiest way to become familiar with the microgrammar. Full instructions for reading these "traces" are offered in the PLACEBO IV paper; here let it suffice to point out that every symbol preceding the symbol "///" is penterminal, and is matched by a terminal symbol (without flanking asterisks) in the string itself; each symbol is preceded by "///" or by the symbol which instantiates it, if any.

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23 Yngve described "random generation" in "The Depth Hypothesis", Proceedings of the Twelfth Symposium in Applied Mathematics, ed. Roman Jakobson, Providence: 1961; and in "Random Generation of English Sentences", 1961 International Conference on Machine Translation of Languages and Applied Language Analysis, Volume I; London: 1962; and again in "Final Report to the National Science Foundation", Massachusetts Institute of Technology Research Laboratory of Electronics, Cambridge: 1965.

24 Computer Programs for Processing Phrase Structure Grammars, by Donald Cohen, Walter Sillars, Richard B. Thomas, National Bureau of Standards Technical Report 8161; 1964; and also in the previously-referenced paper on PLACEBO IV.

25 To be reported on in a future publication.

NUMBER 11

HAVE ANY OF THESE BIG ASTROCYTES REMAINED TRIANGULAR AND EXTREMELY LARGE.

S Q QQ Q2 Q2AJP HVAUX2 /// IJAL N2222Q PARPLUQA ARPN2Q QFR2BQ /// OF /// DFDK2 DKAR2 /// AJNP2 ADJ ADJC AJJC AJC AJCB /// AJJA X /// N222 NN2 NVBAX2 NVBAA /// NFIX1E /// NFIX2S /// XDQ X /// CPBCPP PPVRM VRM /// VFXED /// AJOBAM ADJ ADJC AJJC AJLGC AJLGCB NNBAB /// AJFIXULAR /// AJJA AJJB X /// AND /// AJJJ AJJV JAJV JPV AJLGVD /// JFIXLY /// AJ AJJJC AJC AJCC AJCCB /// AJFIXE /// PT ///

NUMBER 16

IS IT TRUE THAT THIS, HOWEVER, ISN'T FREQUENTLY INTERSECTED BY THE MARK.

S Q QQ RSVP IS /// IT /// XDQ X /// SAJJD SAJDE /// AJFIXE /// THT /// STTTT STMT STTNEG STTNEG3 SB3 PRON3 THIS /// CMSJCM CM /// SJSJ SCJAAE /// CM /// PRED3NEG RELP3NEG EE3NEG EE3POS /// NOT /// DTNEGA DTPOSBA DTPA DTPAB AJDTPA /// DFXLY /// RELOB3 REL RLV RLVA RLVAB VEDB VNTRSCT /// AJFIXED /// BY /// PORLV X /// MARK DFDK1 DEFAR /// MRK /// PT ///

NUMBER 19

DARKEN AND STORE.

S DIR DIRR SYN SYNN PROSS WHCLE /// POSYNN AND /// VPOSYNN /// PT ///

NUMBER 20

YES .

S A YN YES /// XSTMTCJ X /// PT ///

NUMBER 21

FIND THE WIDTH OF PERIMETER OF ALL BLOBS.

S DIR DIRR LYZ VYZPROS LYZAL VLYZAL VLYZB /// LYZMST DEFAR /// XAV X /// LYZMSTT1 LYZMSTT1A PRNCBAG
/// OF /// PRNCBAE /// OF /// OBVLYZAL ALL /// NGEN2 NGEN1 /// NFIX2S /// PT ///

NUMBER 24

THAT COLAGEN MATCHES SOME ARTEFACTAL CYTOPLASM WITH REGARD TO COLOR AND DENSITY.

S STTT STMT STTPOS STTPOS3 SB3 N3 N33 QFAR3 ARPREAR3 PREAR X /// DFDK1 DKAR1 /// AJNP3 N333 NN3 NN3A
NN3AA /// PO3 X /// PRED3POS VP3POS M3POS M /// VFXES /// MOB3 N123 N3 N33 QFAR3 QFR /// AJNP3 ADJ3
AJLGVC NVBAC /// AJFIXAL /// N333 NN3 NN3B CYTO /// NN3BA /// PO3 X /// WRT1 RE /// RSPT1 XAV X ///
NRSPT1 XNRSPT1A X /// NRSPT1A LYZMSTT1 LYZMSTT1A LYZMSTT1AB COLOR /// AND /// NRSPT1A LYZMSTT1 LYZMSTT1B
AJCD /// NFIX1ITY /// PT ///

NUMBER 28

PLEASE REPHRASE.

S A YN WMW /// PT ///

NUMBER 30

LABEL EACH OF THE CONTAINED AND EXTREMELY SMALL BODIES --((-- NIH-M --))-- .

S DIR DIRR LAB LABL /// DEF111 DEF11 EA /// OF /// DEF2 DFDK2 DEFAR /// AJNP2 ADJ ADJC AJJC RELABC XVPLC VPLC VCN /// AJFIXED /// XSB /// AJJA AJJB X /// AND /// AJJJ AJJV JAJV JPV AJLGVD /// JFIXLY /// AJ AJJJC AJC AJCA AJCAB /// N222 NN2 NCBAX2 NCBAF NCBAFA /// NFIX2IES /// PONLAB XWTL X /// DND DL /// NPOLAB KIRSCH RAK /// HYN /// LTR /// DR /// PT ///

NUMBER 31

HOW MUCH OF THE GRAY MATTER-LIKE CORTEX IS NOT DENSE OR MEMBRANAL.

S Q QQ Q3 Q3QFR Q3Q QQFR3 QQFR3A /// OF /// DFDK3 DEFAR /// AJNP3 ADJ3 AJLGLK3 NN3 NN3A NN3AB CLR AJCAAB /// NN3ABA /// AJFIXLK /// N333 NN3 NN3A NN3AB NCBAABA /// NFIX1EX /// PRED3 PRED3NEG AJP3NEG EEE3NEG EEE3POS /// NOT /// AJ3OB ADJ3 AJJ3A AJCD /// AJFIXE /// POAJ.ANDOR /// ADJ3 AJJ3B NCBABDA /// AJFIXAL /// PT ///

NUMBER 37

THERE IS NO MEMBRANE 1 MICRON IN LENGTH.

S STTT STMT STTNEG STTNEG1 THR /// ETHR1POS /// N1111NG INDFARNG /// AJNP1 AJNP1C N111C NCBAX1 NCBAB NCBABD NCBABDA /// NFIX1E /// WHCL1X MST NUM1 Z /// NBR1 /// WATT /// POMU IN /// WOPOMU PRNCBAG /// PT ///

NUMBER 43

DOES THIS EMBRACE THAT.

S Q QQ Q1 Q1VP VAUX1 DO /// VFXES /// SB1 PRON1 THIS /// V VEMBR VEMBRBA /// VFIXE /// VOB1 PRON1 THAT /// PT ///

NUMBER 55

IS IT TRUE THAT THERE ARE S ENDOTHELIUM-LIKE GRANULES WHICH ARENT VERY MUCH LESS OUTWARD THAN

THE MARK.

S Q QQ RSVP IS /// IT /// XDQ X /// SAJJD SAJDE /// AJFIXE /// THT /// STTTT STMT STTPOS STTPOS2 THR /// ETHR2POS /// N2222 NUM2 Z /// NBR2 NBRDGT NBR29 /// AJNP2 ADJ ADJV AJJV AJLGV AJLGLKV12 NVBAX1 NVBAD /// NFIX1UM /// AJFIXLK /// AJJA X /// N222 NON2 NON2C NPREN2222 PRNCBAC /// NFIX2ES /// PONPREN3 X /// WHCL2X WHCL2 WH /// PRED2 PRED2NEG RELP2NEG EE2NEG EE2POS /// NOT /// RELOB2 REL RLV RLVC CPV AJCPV PUM JA /// MUCH /// AJLS LS /// AJNCT ADVOR SPQR RLVAAC /// DFIXWD /// THAN /// PORLV X /// MARK DFDK1 DEFAR /// MRK /// PT ///

NUMBER 63

FIND THE AVERAGE AREA OF ALL THINGS.

S DIR DIRR LYZ VYZPROS LYZAL VLYZAL VLYZB /// LYZMST DEFAR /// XAV AV /// LYZMSTT1 LYZMSTT1A LYZMST1V /// OF /// OBVLYZAL ALL /// NGEN2 NGEN1 /// NFIX2S /// PT ///

NUMBER 66

IS CYTOPLASM-LIKE CORTEX LABELED AS --((-- E-1300 --))-- .

71

S Q QQ Q3 Q3AJP EEE3POS /// INDEF3Q INDFAR3Q /// AJNP3 ADJ3 AJLGLK3 NN3 NN3B CYTO /// NN3BA /// AJFIXLK /// N333 NON3 NPREN33 NN3 NN3A NN3AB NCBAABA /// NFIX1EX /// PONPREN12 PONPREN2 X /// XDQ X /// AJ3OB AJOBP AJVPSVA LABL /// VPSVFXED /// XAS AS /// DND DL /// NPOLAB KIRSCH Z /// LTR /// XHYN HYN /// NBR NBR2 NBRTHSNDS NBR1 /// NBRHDRDSA NBRHDRDA NBRMDGTA NBRMDGT NBR29 /// NBRTENSA NBRTENA NBRMDGTA NBRZO /// NBRMDGTA NBRZO /// DR /// PT ///

NUMBER 78

THIS IS SOMETIMES BIGGER THAN THAT MARK.

S STTT STMT STTPOS STTPOS1 SB1 PRON1 THIS /// PRED1POS RELP1POS EE1POS /// DTPOS DTPOSB DTPOSBB DTPOSBBA /// RELOB1 REL RLV RLVC CPV AJCPV AJMR AJCB /// G /// ER /// THAN /// PORLV X /// MARK DFDK1 DKAR1 /// MRK /// PT ///

NUMBER 91

DRAW A KARYOSOME , ALMOST ALL OF THOSE ASTROCYTES AND AN EPENDYMA WHICH HAS STAYED 1 MICRON

IN LENGTH AND A CONTAINED AND TANGENT PROCESS AND HOLD.

S DIR DIRR SYN SYNN FORGE VFRG /// N123 N2 N2CJ N2CJA N2CJA X /// N123 N1 N11 INDEF INDFRA /// AJNP1C N111C NCBAX1 NCBAH NCBAHA /// NBAFXA NBAFXAA /// NFIX1E /// PO1 X /// CM /// N123 N2 N2QFAR PARPLU2 NARPN2 ARPN2 XJD JD /// ALL /// OF /// DFDK2 DKAR2 /// AJNP2 N222 NN2 NVBAX2 NVBAA /// NFIX1E /// NFIX2S /// PO2 X /// AND /// N123 N2 N2CJ N2CJA X /// N123 N1 N11 INDEF INDFRAN /// AJNP1V N111V NVBAX1 NVBAB /// PO1 PO11 WHCL1 WH /// PRED1 PRED1POS AJP1POS HVAUX1 /// XD X /// CPBCPP PPVRM VRM /// VFXED /// AJOBAM MST NUM1 Z /// NBR1 /// WATT /// POMU IN /// WOPOMU PRNCBAG /// AND /// N123 N1 N11 INDEF INDFRA /// AJNP1C ADJC AJJC RELABC XVPLC VPLC VCN /// AJFIXED /// XSB /// AJJA AJJB X /// AND /// AJJJ AJJC RELABC RLVACAGNC /// N111 NON1 NON1A NPREN11 PRNC1 PRNCBAA /// PONPREN1 X /// PO1 X /// POSYNN AND /// VPOSYNN /// PT ///

NUMBER 99

CAJAL THE LEAST OUTWARD NUCLEOLUS AND STORE.

S DIR DIRR SYN SYNN FORGE VFRG /// N123 N1 N11 DEF DEFAR /// AJSPV AJLT LT /// AJNCT ADVOR SPQR RLVAAC /// DFIXWD /// N111 N NCBAX1 NCBAC /// NFIX1US /// PO1 X /// POSYNN AND /// VPOSYNN /// PT ///

NUMBER 108

LABEL THAT AREA WITH THE LABEL --((-- THE DENSEST TOPMOST ASTROCYTE'S AREA --))-- .

S DIR DIRR LAB LABL /// DEF111 DEF1 DFDK1 DKAR1 /// AJNP1 AJNP1V N111V PRNV1 PRNVBAA /// PONPREN12 PONPREN1
X /// PONLAB XWTL WITH /// DEFAR /// LABL /// DND DL /// NPOLAB LIPKIN N1 N11 DEF DEFAR /// AJSPV AJMT
AJCD /// EST /// N111 NON1 NCN1A AJNP11 AJSPV AJMT AJRLV AJLGRLVA /// AJFIXMT /// N111 N NVBAX1 NVBAA
/// NFIX1E /// ARGEN /// NPREN11 PRNV1 PRNVBAA /// PO1 X /// DR /// PT ///

NUMBER 122

EXTRACT ALL THE AXONS, SKETCH AND STORE.

S DIR DIRR SYN SYNN PROSS PART XTR EXTR VEXTR /// POVEXTR PICSPEC ALL /// DEF2 DFDK2 DEFAR /// AJNP2
N222 NN2 NVBAX2 NVBAC /// NFIX2S /// POEXTR CM /// WHOLE /// POSYNN AND /// VPOSYNN /// PT ///

NUMBER 123

THERE ARE NO OUTSIDE AND BIG GRANULES 1 MICRON IN LENGTH.

S STTT STMT STTNEG STTNEG2 THR /// ETHR2POS /// N2222NG INDFARNGB INDFARNG /// AJNP2 ADJ ADJV AJJV RELABV
RLVAAE RLVAAC /// RLVAAF /// AJJA AJJB X /// AND /// AJJJ AJJC AJC AJCB /// N222 NON2 NON2C NPREN2222
PRNCBAC /// NFIX2ES /// PONPREN3 X /// WHCL2X MST NUM1 Z /// NBR1 /// WATT /// POMU IN /// WOPOMU PRNCBAG
/// PT ///

NUMBER 126

THERE ARE EPENDYMAS THERE.

S STTT STMT STTPOS STTPOS2 THR /// ETHR2POS /// N2222 INDEF2 INDFAR2 /// AJNP2 N222 NN2 NVBAX2 NVBAB /// NFIX2S /// WHCL2X LOC HR /// PT ///

NUMBER 127

COUNT THE OLIGOS.

S DIR DIRR LYZ VYZPROS LYZSPEC VLYZA /// DEF2 DFDK2 DEFAR /// AJNP2 N222 NN2 NVBAX2 NVBAE NVBAEBRV /// NFIX2S /// PT ///

NUMBER 132

AN EXTREMELY BIG AND DISPERSED AREA IS HARDLY EVER THIS PEAR-SHAPED THING.

S STTT STMT STTNEG STTNEG1 SB1 N1 N11 INDEF INDFRAN /// AJNP1V ADJV AJJV JAJV JPV AJLGVD /// JFIXLY /// AJ AJJJC AJC AJCB /// AJJA AJJB X /// AND /// AJJJ AJJC RELABC RLDS RLDSA RLDSANB /// AJFIXED /// N111 NON1 NON1A NPREN11 PRNV1 PRNVBAA /// PONPREN1 X /// PO1 X /// PRED1NEG EP1NEG E1POS /// DTNEGB DTNB JC /// DT /// EOB1 PRON1 PRONP1 DKAR1 /// ADJ ADJC AJJC AJLGC AJLGCA AJLGCAD /// AJJA X /// NGEN1 /// PT ///

NUMBER 145

COUNT AND LIST THE INCLUSIVE AND EXTREMELY DENSE MICROGLIAE.

S DIR DIRR LYZ VYZPROS LYZSPEC VLIST VVLIST VLYZA /// AND /// VVVLIST /// POVVLISTA X /// POVVLISTB X /// DEF2 DFDK2 DEFAR /// AJNP2 ADJ ADJV AJJV RELABV XVPLV VPLVING VEIV VINCLBAB VINCLBAAA /// VINCLBABB /// AJFIXIVE /// XOB /// AJJA AJJB X /// AND /// AJJJ AJJV JAJV JPV AJLGVD /// JFIXLY /// AJ AJJJC AJC AJCD /// AJFIXE /// N222 NN2 NCBAX2 NCBAE /// NFIX2E /// PT ///

NUMBER 167

NO/, THERE ARE PRACTICALLY NONE OF THE KARYOSOMES HERE BUT THAT MASS , NEVERTHELESS, IS PRACTICALLY ALWAYS AT 4 O'CLOCK .

S A YN NO /// XSTMTCJ SEMICOL /// STMTCJ STCMPD STMT STTNEG STTNEG2 THR /// ETHR2POS /// N2222NG QFR2NG

QFR22NG XJD JD /// QFR2NC /// OF /// DEF2 DFDK2 DEFAR /// AJNP2 N222 NN2 NCBAX2 NCBAH NCBAHA /// NBAFXA NBAFXAA /// NFIX1E /// NFIX2S /// WHCL2X LOC HR /// CJCM XCM X /// CJ /// STMT STTPOS STTPOS1 SB1 N1 N11 DEF DFDK1 DKAR1 /// AJNP1 AJNP1C N111C NCBAX1 NCBAA NCBAAA /// PO1 X /// CMJJCM CMSJCM CM /// SJSJ SJSJSJ SCJAAF /// CM /// PRED1POS RELP1POS EE1POS /// DTPOS XJD JD /// DTPOSA DTPOSAA /// RELOB1 RELAB1 RLVACSPAB CHARYBDIS PREPDIRA /// PSFS CLCS /// CLC /// XN123 /// POCJ X /// PT ///

NUMBER 172

LABEL THE NUCLEUS --((-- NIH-F --))-- .

S DIR DIRR LAB LABL /// DEF111 DEF1 DFDK1 DEFAR /// AJNP1 AJNP1C N111C PRNC1 PRNCBAB /// NFIX1US ///

PONPREN12 PONPREN1 X /// PONLAB XWTL X /// DND DL /// NPOLAB KIRSCH RAK /// HYN /// LTR /// DR /// PT ///

NUMBER 185

PUT A MARK THERE, EXTRACT ALL THESE EPENDYMAS, SHRINK AND HOLD.

S DIR DIRR SYN SYNN PROSS PART MRKK VMRK VMARK /// INDFRA /// MRK /// LOC HR /// CM /// XTR EXTR VEXTR /// POVEXTR PICSPEC ALL /// DEF2 DFDK2 DKAR2 /// AJNP2 N222 NN2 NVBAX2 NVBAB /// NFIX2S /// POEXTR CM /// WHOLE /// POSYNN AND /// VPOSYNN /// PT ///

NUMBER 193

THERE IS NO ASTROCYTIC FLAKE WHICH IS NOT, IN ANY CASE, INCLUSIVE OF THE MARK.

S STTT STMT STTNEG STTNEG1 THR /// ETHR1POS /// N1111NG INDFARNG /// AJNP1 AJNP1V ADJV AJJV AJLGV AJLGVC NVBAA /// AJFIXIC /// AJJA X /// N111 NON1 NON1C NPREN1111 PRNC111 PRNCBAD /// PONPREN3 X /// WHCL1X WHCL1 WH /// PRED1 PRED1NEG RELP1NEG EE1NEG EE1POS /// NOT /// CMSJCM CM /// SJSJ SCJAAB /// CM /// RELOB1 REL RLV RLVA RLVAB VE1V VINCLBAB VINCLBAAA /// VINCLBABB /// AJFIXIVE /// OF /// PORLV X /// MARK DFDK1 DEFAR /// MRK /// PT ///

NUMBER 198

IF AND ONLY IF THERE IS NOT ANY WHITE MATTER THERE, THEN THOSE ARE THOSE .

S STTT STMTCJ STCMPD IFF /// STMT STTNEG STTNEG3 THR /// ETHR3NEG ETHR3POS /// NOT /// N333A INDFARNGA /// AJNP3 N333 NN3 NN3A NN3AB CLR AJCCA /// AJFIXE /// NN3ABA /// WHCL3X LOC HR /// CJPLYC XCM CM /// CJPLYAA /// STMT STTPOS STTPCS2 SB2 PRON2 THOSE /// PRED2POS EP2POS E2POS /// EOB2 PRON2 THOSE /// POCJ X /// PT ///

NUMBER 208

NO, CYTOPLASM IS NOT, STILL, MUSCULAR .

S A YN NO /// XSTTNEG CM /// STTNEG STTNEG3 SB3 N3 N33 QFAR3 QFR /// AJNP3 N333 NN3 NN3B CYTO /// NN3BA /// PO3 X /// PRED3NEG AJP3NEG EEE3NEG EEE3POS /// NOT /// CMSJCM CM /// SJSJ SJSJSJ SCJAAA /// CM /// AJ3OB ADJ3 AJJ3B NCBABEA /// AJFIXULAR /// POAJ X /// PT ///

NUMBER 216

EXTRACT ALL OF THIS PICTURE 12 BITS FROM THE MARK ANO HOLO.

S DIR DIRR SYN SYNN PROSS PART XTR EXTR VEXTR /// POVEXTR PICALL ALPC DETAL AL /// OF /// OFOK1 OKAR1

/// NICON /// LOCEXTR PREFRMRK2 NUM2 Z /// NBR2 NBRTENS NBRTEN NBRMDGT NBR1 /// NBRMDGTA NBRMDGT NBR29 /// BIT /// NFIX2S /// FROMRK FROM /// DFDK1 OEFAR /// MRK /// POEXTR X /// POSYNN ANO /// VPOSYNN /// PT ///

NUMBER 222

IS THERE AN OLIGO WHICH POSSESSES THE LEAST LINEAR LEAST INWARD ASTROCYTE'S AREA ..

77

S DIR DIRR LYZ Q QQ Q1 Q1VP ETHP1 ETHR1POS /// THR /// XDQ X /// PMLA N1111 INDEF INOFRAN /// AJNP1V N111V NVBAX1 NVBAE NVBAEBRV /// WHV1 WH /// VP1 VP1P V1POS VPS /// VFXES /// VOB1 N1 N11 OEF DEFAR /// AJSPV AJLT LT /// AJNCT AJLG AJLGC AJLGCB NNBAA /// AJFIXAR /// N111 NON1 NON1A AJNP11 AJSPV AJLT LT /// AJNCT ADVOR SPQR RLVAAA /// DFIXWO /// N111 N NVBAX1 NVBAA /// NFIX1E /// ARGEN /// NPREN11 PRNV1 PRNVBAA /// PO1 X /// PT /// PT ///

NUMBER 226

THERE IS AN ASTROCYTE 3 MICRONS IN HEIGHT.

S STTT STMT STTPOS STTPOS1 THR /// ETHR1POS /// N1111 INDEF INDFRAN /// AJNP1V N111V NVBAX1 NVBAA /// NFIX1E /// WHCL1X MST NUM2 Z /// NBR2 NBROGT NBR29 /// WATT /// NFIX2S /// POMU IN /// WOPOMU PRNCBAG /// PT ///

NUMBER 227

YES, THAT, HOWEVER, IS PROBABLY INSIDE .

S A YN YES /// XSTTPOS CM /// STTPOS STTPOS1 SB1 PRON1 THAT /// CMJJCM CMSJCM CM /// SJSJ SCJAAE /// CM /// PRED1POS RELP1POS EE1POS /// DTPOS DTPOSB DTPOSBA DTPB A8B /// DFXY /// RELOB1 RELAB1 RELAB1V RELABV RLVAAE RLVAAA /// RLVAAF /// XN123 /// PT ///

NUMBER 228

CALL UP THOSE VENTRICLES AND DISPLAY.

S DIR DIRR SYN SYNN CALL VCALL /// OBVCALL DEF2 DFDK2 DKAR2 /// AJNP2 N222 NN2 NCBAX2 NCBAB NCBABE NCBABEA /// NFIX1LE /// NFIX2S /// POSYNN AND /// VPOSYNN /// PT ///

NUMBER 229

LABEL EACH OF THE NUCLEIC AND INTERSECTING EPENDYMAS WITH THE LABEL --((-- EPENDYMA --))--

S DIR DIRR LAB LABL /// DEF111 DEF11 EA /// OF /// DEF2 DFDK2 DEFAR /// AJNP2 ADJ ADJC AJJC AJLGC AJLGCC NCBAC /// AJFIXIC /// AJJA AJJB X /// AND /// AJJJ AJJV RELABV XVPLV VPLVING VNTRSCT /// AJFIXING /// N222 NN2 NVBAX2 NVBAB /// NFIX2S /// PONLAB XWTL WITH /// DEFAR /// LABL /// DND DL /// NPOLAB LIPKIN AJNP1 AJNP1V N111V NVBAX1 NVBAB /// DR /// PT ///

NUMBER 230

COUNT ALL OBJECTS.

S DIR DIRR LYZ VYZPROS LYZAL VLYZAL VLYZA /// OBVLYZAL ALL /// NGEN2 NGEN1 /// NFIX2S /// PT ///

NUMBER 241

CAJAL THAT AXON AND STORE.

S DIR DIRR SYN SYNN FORGE VFRG /// N123 N1 N11 DEF DFDK1 DKAR1 /// AJNP1 AJNP1V N111V NVBAX1 NVBAC /// PO1 X /// POSYNN AND /// VPOSYNN /// PT ///

NUMBER 246

IS IT TRUE THAT THERE AREN'T ANY DENDRITES HERE..

S DIR DIRR LYZ Q QQ RSVP IS /// IT /// XDQ X /// SAJJD SAJDE /// AJFIXE /// THT /// STTTT STMT STTNEG STTNEG2 THR /// ETHR2NEG ETHR2POS /// NOT /// N2222A INDFARNGA /// AJNP2 N222 NN2 NCBAX2 NCBAD /// NFIX1E /// NFIX2S /// WHCL2X LOC HR /// PT /// PT ///

NUMBER 251

NO/, THAT, HOWEVER, HAS REMAINED OUTSIDE DESPITE THE FACT THAT THERE IS 1 ASTROCYTE 1 MICRON IN LENGTH .

S A YN NO /// XSTMTCJ SEMICOL /// STMTCJ STCMPD STMT STTPOS STTPOS1 SB1 PRON1 THAT /// CMJJCM CMSJCM CM /// SJSJ SCJAAE /// CM /// PRED1POS AJP1POS HVAUX1 /// XD X /// CPBCPP PPVRM VRM /// VFXED /// AJOBAM ADJ ADJV AJJV RELABV RLVAAE RLVAAC /// RLVAAF /// AJJA X /// OGRE XCM X /// CJBECK CJBECB CJBECBA CJBECBAA /// N8 ARINV /// N88 /// THT /// STMT STTPOS STTPOS1 THR /// ETHR1POS /// N1111 NUM1 Z /// NBR1 /// AJNP1 AJNP1V N111V NVBAX1 NVBAA /// NFIX1E /// WHCL1X MST NUM1 Z /// NBR1 /// WATT /// POMU IN /// WOPOMU PRNCBAG /// POCJ X /// PT ///

NUMBER 257

YES, THERE IS COLAGEN FURTHER FROM THAT MARK THAN FROM THIS MARK.

S A YN YES /// XSTTPOS CM /// STTPOS STTPOS3 THR /// ETHR3POS /// N333 NN3 NN3A NN3AA /// WHCL3X RELOBA REL RLVD BU X /// RLDSANACPV RLDSANAA RLDSAND /// AJFIXTHER TH /// ER /// AWAY /// OBAWAY MARK DFDK1 DKAR1 /// MRK /// THAN /// FROM /// MARK DFDK1 DKAR1 /// MRK /// PT ///

NUMBER 260

PLEASE REPHRASE.

S A YN WMW /// PT ///

NUMBER 279

IS IT CERTAIN THAT THIS, FREQUENTLY, IS ALWAYS TOWARD THE LEFT ..

S DIR DIRR LYZ Q QQ RSVP IS /// IT /// XDQ X /// SAJJD SAJDB /// THT /// STTTT STMT STTPOS STTPOS3 SB3
PRON3 THIS /// CMJJCM XCMJJXCM CM /// DTPOSB DTPOSBA DTPA DTPAB AJDTPA /// DFXLY /// CM /// PRED3POS
RELP3POS EE3POS /// DTPOS XJC X /// DTPOSA DTPOSAA /// RELOB3 RELAB RLVACSPAB SCYLLA XIPE PREPDIR ///
TOTEC ARINV /// AJLGRLV /// XN123 /// PT /// PT ///

NUMBER 314

WHICH NUCLEUS IS SCARCELY EVER NEARBY .

S Q QQ Q1 Q1QFR Q1Q QQFRWH QQFRWHA /// AJNP1 AJNP1C N111C PRNC1 PRNCBAB /// NFIX1US /// PONPREN12 PONPREN2
X /// PRED1 PRED1NEG RELP1NEG EE1POS /// DTNEGB DTNB JC /// DT /// RELOB1 RELAB1 RELAB1C RLVACAGNC ///
XN123 /// PT ///

NUMBER 328

DOES THIS DENSE AND OUTSIDE BLOB SOMETIMES CONTAIN THE LEAST DENSE DENDRITE .

S Q QQ Q1 Q1VP VAUX1 DO /// VFXES /// SB1 PRON1 PRONP1 DKAR1 /// ADJ ADJC AJJC AJC AJCD /// AJFIXE /// AJJA AJJB X /// AND /// AJJJ AJJV RELABV RLVAAE RLVAAC /// RLVAAF /// NGEN1 /// DQ DTPOS DTPOSB DTPOSBB DTPOSBBA /// V VCN /// VOB1 N1 N11 DEF DEFAR /// AJSPV AJLT LT /// AJNCT AJC AJCD /// AJFIXE /// N111 N NCBAX1 NCBAD /// NFIX1E /// PO1 X /// PT ///

NUMBER 330

STILL THOSE ARE INVARIABLY AS DENCE AS 4 OF THOSE EXTREMELY TRIANGULAR OLIGOS .

S STTT STMTSJ SJ SCJA SCJAA SCJAAA /// XCM X /// STTTT STMT STTPOS STTPOS2 SB2 PRON2 THOSE /// PRED2POS RELP2POS EE2POS /// DTPOS XJD X /// DTPOSA AJDTPOSA AJNEGFXC /// AJBAA VVYBA /// I /// AJFIXABL /// DFXY /// RELOB2 RLVI AS /// RLDS RLDSB RLDSBNA /// AJFIXE /// AS /// N2 N2QFAR PARPLU2 NARPN2 NUM2 Z /// NBR2 NBRDGT NBR29 /// OF /// DFDK2 DKAR2 /// AJNP2 ADJ ADJV AJJV JAJV JPV AJLGVD /// JFIXLY /// AJ AJJJC AJLGC AJLGCB NNBAB /// AJFIXULAR /// AJJA X /// N222 NN2 NVBAX2 NVBAE NVBAEBRV /// NFIX2S /// PO2 X /// PT ///

NUMBER 344

DOES 1 OF THE AXONS INVARIABLY HAVE AN AVERAGE SHAPE EQUAL TO 3 MICRONS IN WIDTH.

S Q QQ Q1 Q1HQP VAUX1 DO /// VFXES /// SB1 N1 N11 PARPLU NUM1 Z /// NBR1 /// OF /// DFDK2 DEFAR /// AJNP2 N222 NN2 NVBAX2 NVBAC /// NFIX2S /// PO1 X /// DQ DTPOS XJD X /// DTPOSA AJDTPOSA AJNEGFXC /// AJBAA VVYBA /// I /// AJFIXABL /// DFXY /// HQ VHQBAA /// VHQBAB /// HQOB1 LYZMSTT1V INDFRAN /// LYZMSTT1VV AV /// LYZMSTT1CC PRNCBAF /// EQL EQU /// POEQ MST NUM2 Z /// NBR2 NBRDGT NBR29 /// WATT /// NFIX2S /// POMU IN /// WOPOMU PRNCBAG /// PT ///

NUMBER 345

YES/, WHEN THERE ARENT ANY EPENDYMAS AT 1 ON THE X COORDINATE AND 800 ON THE Y COORDINATE, NEITHER 1904 OF THE MICROGLIAE WHICH HAVE A DISTANCE APART EQUAL TO THAT OF NONE OF THE CYTOPLASM NOR 1 OF THE CONTAINED AND OLIGODENDROGLIAL FLAKES AND .1 OF THE GRAY MATTER-LIKE NUCLEOLOPLASM OF THE LEAST INWARD GRANULE OF LIGHT CORTEX EMBRACE THE BLUEST FLAKE AND A DISPERSED PROCESS /, BECAUSE SINCE NUCLEOPLASM , HOWEVER, IS HARDLY EVER FURTHER AWAY FROM THE AXON THAN FROM THE MARK, PRACTICALLY NONE OF THE EPENDYMAS , STILL, ARE ALWAYS TANGENT .

S A YN YES /// XSTMTCJ SEMICCL /// STMTCJ STCMPD NACXIT /// STMT STTNEG STTNEG2 THR /// ETHR2NEG ETHR2POS /// NOT /// N2222A INDFARNGA /// AJNP2 N222 NN2 NVBAX2 NVBAB /// NFIX2S /// WHCL2X LOC AT /// LOCX NUM NUM1 Z /// NBR1 /// CORX /// AND /// XAT X /// LOCY NUM NUM2 Z /// NBR2 NBRHDRDS NBRHDRD NBRMDGT NBR29 /// NBRTENSA NBRTENA NBRMDGTA NBRZO /// NBRMDGTA NBRZO /// CORY /// CM /// STMT STTNEG STTNEG2 SB2NEG N2QFARNEG N2CJNEGA NIA /// N2 N2QFAR PARPLU2 NARPN2 NUM2 Z /// NBR2 NBRTHSNDS NBR1 /// NBRHDRDSA NBRHDRDA NBRMDGTA NBRMDGT NBR29 /// NBRTENSA NBRTENA NBRMDGTA NBRZO /// NBRMDGTA NBRMDGT NBR29 /// OF /// DFDK2 DEFAR /// AJNP2 N222 NN2 NCBAX2 NCBAE /// NFIX2E /// PO2 PO22 WHCL2 WH /// PRED2 PRED2POS VP2POS HQ2POS HQ VHQBAA /// VHQBAB /// HQOB2 INDFRA /// LYZMSTT2A LYZMSTT2AA LYZMSTT2AAC /// EQL EQU /// POEQ POEQN THOF /// N123 N3 N33 QFAR3 ARPREAR3 PREAR PREAR3 MOOF PROXQUAN /// OF /// DFDK1 DEFAR /// AJNP3 N333 NN3 NN3B CYTO /// NN3BA /// PO3 X /// NIB /// N2 N2CJ N2CJA X /// N123 N1 N11 PARPLU NUM1 Z /// NBR1 /// OF /// DFDK2 DEFAR /// AJNP2 ADJ ADJC AJJC RELABC XVPLC VPLC VCN /// AJFIXED /// XSB /// AJJA AJJB X /// AND /// AJJJ AJJV AJLGV AJLGVC NVBAEBRV /// NVBAEFUL /// AJFIXAL /// N222 NON2 NON2C NPREN2222 PRNCBAD /// NFIX2S /// PONPREN3 X /// PO1 X /// AND /// N123 N3 N33 QFAR3 ARPREAR3 PREAR PREAR3 MOOF PROXNOR PROX X /// Z /// NOR DEC Z /// PTT /// NBR NBR1 /// OF /// DFDK1 DEFAR /// AJNP3 ADJ3 AJLGLK3 NN3 NN3A NN3AB CLR AJCAAB /// NN3ABA /// AJFIXLK /// N333 NON3 NPREN33 NN3 NN3B NCBAC /// AJFIXO /// NN3BA /// PONPREN12 PONPREN1 OF /// N1 N11 DEF DEFAR /// AJSPV AJLT LT /// AJNCT ADVOR SPQR RLVAAA /// DFIXWD /// N111 NON1 NON1C NPREN1111 PRNC111 PRNCBAC /// NFIX1E /// PONPREN3 OF /// AJNP3 ADJ3 AJJ3A AJCAA AJCAAA /// N333 NN3 NN3A NN3AB NCBAABA /// NFIX1EX /// PO1 X /// PO3 X /// PO2 X /// PRED2POS VP2POS V2POS VEMBR VEMBRBA /// VFIXE /// VOB2 PRDN2 N2CJ N2CJA X /// N123 N1 N11 DEF DEFAR /// AJSPV AJMT AJCC AJCCA /// EST /// N111 NON1 NON1C NPREN1111 PRNC111 PRNCBAD /// PONPREN3 X /// PO1 X /// AND /// N123 N1 N11 INDEF INDFRA /// AJNP1C ADJC AJJC RELABC RLDS RLDSA RLDSANB /// AJFIXED /// AJJA X /// N111 N NCBAX1 NCBAA NCBAAA /// PO1 X /// POCJ CJJ SEMICOL /// CJJJ CJBECAA /// STT STMTCJ STCMPD NACXIT /// STMT STTNEG STTNEG3 SB3 N3 N33 QFAR3 QFR /// AJNP3 N333 NON3 NPREN33 NN3 NN3B NCBAC /// AJFIXO /// NN3BA /// PONPREN12 PONPREN1 X /// PO3 X /// CMSJCM CM /// SJSJ SCJAAE /// CM /// PRED3NEG RELP3NEG EE3POS /// DTNEGB DTNB JC /// DT /// RELOB3 REL RLVD BU X /// RLDSANACPV RLDSANAA RLDSAND /// AJFIXTHER TH /// ER /// AWAY /// OBAWAY N123 N1 N11 DEF DFDK1 DEFAR DEFAR
/// AJNP1 AJNP1V N111V PRNV1 PRNVBA /// PONPREN12 PONPREN1 X /// PO1 X /// THAN /// FROM /// MARK DFDK1 DEFAR /// MRK /// CM /// STMT STTNEG STTNEG2 SB2NEG N2QFARNEG N2222NG QFR2NG QFR22NG XJD JD /// QFR2NC /// OF /// DEF2 DFDK2 DEFAR /// AJNP2 N222 NN2 NVBAX2 NVBAB /// NFIX2S /// PO2 X /// CMSJCM CM /// SJSJ SJSJSJ SCJAAA /// CM /// PRED2POS RELP2POS EE2POS /// DTPOS XJD X /// DTPOSA DTPOSAA /// RELOB2 RELAB RELABC RLVACAGNC /// XN123 /// POCJ X /// PT ///

NUMBER 347

NO/, IF THAT VERY LARGE OBJECT HAS A PERIMETER EQUAL TO 24 MICRONS IN WIDTH, THEN THIS DENS

E SUBSTANCE SOMETIMES MATCHES THE CHROMATIN WITH RESPECT TO AVERAGE SIZE .

S A YN NO /// XSTMTCJ SEMICOL /// STMTCJ STCMPD IF /// STMT STTPOS STTPOS1 SB1 PRON1 PRONP1 DKAR1 ///
ADJ ADJC AJJC JAJC JPC JA /// POJA X /// AJ AJJJC AJC AJCC AJCCB /// AJFIXE /// AJJA X /// NGEN1 ///
PRED1POS VP1POS HQ1POS VHQBAA /// VFXS /// HQOB1 LYZMSTT1C INDFRA /// LYZMSTT1CC PRPRNCBAE X /// PRNCBAE
/// EQL EQU /// POEQ MST NUM2 Z /// NBR2 NBRTENS NBRTEN NBRMDGT NBR29 /// NBRMDGTA NBRMDGT NBR29 ///
WATT /// NFIX2S /// POMU IN /// WOPOMU PRNCBAG /// CJPLYA XCM CM /// CJPLYAA /// STMT STTPOS STTPOS3
SB3 PRON3 PRONP3 DKAR3 /// ADJ3 AJJ3A AJCD /// AJFIXE /// NGEN3 /// CMJJCM XCMJJXCM DTPOSB DTPOSBB DTPOSBBA
/// PRED3POS VP3POS M3POS M /// VFXES /// MOB3 N123 N3 N33 QFAR3 ARPREAR3 PREAR X /// DFDK1 DEFAR ///
AJNP3 N333 NON3 NPREN33 NN3 NN3A NN3AA /// PONPREN12 PONPREN2 X /// PO3 X /// WRT1 RE /// RSPT1 XAV
AV /// NRSPT1 NRSPT1A LYZMSTT1 LYZMSTT1A LYZMSTT1AC /// POCJ X /// PT ///

NUMBER 348

THERE IS NO EPENDYMA FURTHER AWAY FROM THIS MARK THAN FROM THIS MARK.

S STTT STMT STTNEG STTNEG1 THR /// ETHR1POS /// N1111NG INDFARNG /// AJNP1 AJNP1V N111V NVBAX1 NVBAB
/// WHCL1X RELOBA REL RLVD BU X /// RLDSANACPV RLDSANAA RLDSAND /// AJFIXTHER TH /// ER /// AWAY ///
OBAWAY MARK DFDK1 DKAR1 /// MRK /// THAN /// FROM /// MARK DFDK1 DKAR1 /// MRK /// PT ///

NUMBER 349

AT ANY RATE IT IS OBVIOUS THAT THIS, AT ANY RATE, IS, HOWEVER, 1 MICRON IN PERIMETER WHENCE

IT FOLLOWS THAT THERE IS NO ARACHNOIDAL CYTOPLASM WHICH IS 1 BIT AWAY .

S STTT STMTSJ SJ SCJB XSCJA SCJA SCJAA SCJAAB /// XCM X /// SAJSA IT /// IS /// XD X /// SAJJD SAJDB
/// THT /// STTTT STMTCJ STCMPD STMT STTPOS STTPOS3 SB3 PRON3 THIS /// CMJJCM CMSJCM CM /// SJSJ SCJAAB
/// CM /// PRED3POS AJP3POS EEE3POS /// DSJPOS CMSJCM CM /// SJSJ SCJAAE /// CM /// AJ3OB MST NUM1 Z
/// NBR1 /// WATT /// POMU IN /// WOPOMU PRNCBAE /// ERGO XCM X /// XT XANADU WHN /// XIFT IFT IT ///
FW FLLW /// VFXS /// THT /// STMT STTNEG STTNEG3 THR /// ETHR3POS /// N333NG INDFARNGC INDFARNG ///
AJNP3 ADJ3 AJLGVC NVBAC /// AJFIXAL /// N333 NN3 NN3B CYTO /// NN3BA /// WHCL3X WHCL3 WH /// PRED3 PRED3POS
RELP3POS EE3POS /// RELOB3 RELAB RLVBA DERITH DERITH1 NUM1 Z /// NBR1 /// MU1 BIT /// MAW /// XN123
/// POCJ X /// PT ///

NUMBER 358

CALL UP THOSE TANGENT AND NEARBY MASS - COLUMNS AND DISPLAY.

S DIR DIRR SYN SYNN CALL VCALL /// OBVCALL DEF2 DFDK2 DKAR2 /// AJNP2 ADJ ADJC AJJC RELABC RLVACAGNC

/// AJJA AJJB X /// AND /// AJJJ AJJC RELABC RLVACAGNC /// N222 NON2 NON2B N NCBAX1 NCBAA NCBAAA ///
Z /// HYN /// NPREN222 PRNCBAL /// NFIX2S /// POSYNN AND /// VPOSYNN /// PT ///

NUMBER 361

LABEL THIS AREA WITH THE LABEL --((-- VERY MUCH MORE CAP-LIKE AND SHARP OLIGO - AREA --))--

S DIR DIRR LAB LABL /// DEF111 DEF1 DFDK1 DKAR1 /// AJNP1 AJNP1V N111V PRNV1 PRNVBAA /// PONPREN12 PONPREN2
X /// PONLAB XWTL WITH /// DEFAR /// LABL /// DND DL /// NPOLAB LIPKIN AJNP1 AJNP1C ADJC AJJC AJCPV
PUM JA /// MUCH /// AJMR MR /// AJLG AJLGC AJLGLKC12 AJNC12 PRNCBAN /// AJFIXLK /// AJJA AJJB X ///
AND /// AJJJ AJJC AJC AJCA AJCAB /// N111 NON1 NON1D N NVBAX1 NVBAE NVBAEBRV /// Z /// HYN /// NPREN111B
PRNV11B PRNVBAA /// DR /// PT ///

NUMBER 365

IS THIS INDISTINGUISHABLE FROM AND INSIDE OF SOME OF THE DENSE NISSL SUBSTANCE

S Q QQ Q1 Q1RELP EE1POS /// SB1 PRON1 THIS /// RELOB1 REL RLV RLVG AJREL AJRELC AJNEGFXC /// AJRELB
/// FROM /// PORLV AND /// RLV RLVA RLVAA RLVAAA /// RLVAAB RLVAAD /// PORLV X /// N123 N3 N33 QFAR3
ARPREAR3 PREAR PREAR3 MOOF PROXQUAN /// OF /// DFDK1 DEFAR /// AJNP3 ADJ3 AJJ3A AJCD /// AJFIXE ///
N333 NON3 NPREN33 NN3 NN3A NN3AA /// PONPREN12 PONPREN1 X /// PO3 X /// PT ///

NUMBER 366

IS THERE GRAY MATTER ABOVE .

S Q QQ Q3 Q3RELP ETHP3 ETHR3POS /// THR /// XDQ X /// INDEF3Q INDFAR3Q /// AJNP3 N333 NN3 NN3A NN3AB CLR AJCAAB /// NN3ABA /// WHCL3XB RELOB3 RELAB RLVACSPAB SCYLLA TSPS /// XN123 /// PT ///

NUMBER 380

YES, THIS MUCH DENSER OBJECT IS OCCASIONALLY 1 OF THE NUCLEI .

S A YN YES /// XSTTPOS CM /// STTPOS STTPOS1 SB1 PRON1 PRONP1 DKAR1 /// ADJ ADJC AJJC AJCPV PUM MUCH /// AJMR AJCD /// ER /// AJJA X /// NGEN1 /// PRED1POS EP1POS E1POS /// DTPOS DTPOSB DTPOSBB UAXACTUN AJDTPOSB /// DFXLY /// EOB1 N1 N11 PARPLU NUM1 Z /// NBR1 /// OF /// DFDK2 DEFAR /// AJNP2 N222 NN2 NCBAX2 NCBAC /// NFIX2I /// PO1 X /// PT ///

NUMBER 383

DOES THAT NEURONAL SUBSTANCE MATCH SOME PIA MATTER-LIKE NISSL SUBSTANCE WITH REGARD TO AVERAGE DENSITY.

S Q QQ Q3 Q3MP VAUX3 DO /// VFXES /// SB3 PRON3 PRONP3 DKAR3 /// ADJ3 AJJ3B NCBABA /// AJFIXAL /// NGEN3 /// M /// MOB3 N123 N3 N33 QFAR3 QFR /// AJNP3 ADJ3 AJLGLK3 NN3 NN3A NN3AB NN3AC /// NN3ABA /// AJFIXLK /// N333 NN3 NN3A NN3AA /// PO3 X /// WRT1 RE /// RSPT1 XAV AV /// NRSPT1 NRSPT1A LYZMSTT1 LYZMSTT1B AJCD /// NFIX1ITY /// PT ///

NUMBER 395

EITHER PRACTICALLY NONE OF THOSE EPENDYMAS , HOWEVER, ARE OCCASIONALLY THOSE EXTREMELY ARTEFACT AL, NUCLEIC AND INTERSECTING OBJECTS OR ONLY A SMALL AMOUNT OF THE NUCLEOLOPLASM HAS REMAIN ED NUCLEOLOPLASM /, WHEREAS IF THERE IS 1 GRANULE-LIKE BODY HERE, THIS, NEVERTHELESS, IS PLAINLY OUTSIDE .

S STTT STMTCJ STCMPD XCJEO CJEO /// STMT STTNEG STTNEG2 SB2NEG N2QFARNEG N2222NG QFR2NG QFR22NG XJD JD /// QFR2NC /// OF /// DEF2 DFDK2 DKAR2 /// AJNP2 N222 NN2 NVBAX2 NVBAB /// NFIX2S /// PO2 X /// CMSJCM CM /// SJSJ SCJAAE /// CM /// PRED2POS EP2POS E2POS /// DTPOS DTPOSB DTPOSBB UAXACTUN AJDTPOSB /// DFXLY /// EOB2 PRON2 PRONP2 DKAR2 /// ADJ ADJV AJJV JAJV JPV AJLGVD /// JFIXLY /// AJ AJJJV AJLGV AJLGVC NVBAC /// AJFIXAL /// AJJA AJJB CM /// AJJD AJJJ AJJC AJLGC AJLGCC NCBAC /// AJFIXIC /// AJJB X /// AND /// AJJJ AJJV RELABV XVPLV VPLVING VNTRSCT /// AJFIXING /// NGEN2 NGEN1 /// NFIX2S /// CJEOA /// STMT STTNEG STTNEG3 SB3NEG N333NG QFR3NG QFR33NG QFR3NB XJN JN /// QFR3NC /// OF /// DEF3 DFDK3 DEFAR /// AJNP3 N333 NON3 NPREN33 NN3 NN3B NCBAC /// AJFIXO /// NN3BA /// PONPREN12 PONPREN2 X /// PO3 X /// PRED3POS EP3POS HVAUX3 /// XD X /// CPBCPP PPVRM VRM /// VFXED /// EOB3 EPRDN3 EPRDN33 EPRDQFR /// AJNP3 N333

NN3 NN3B NCBAC /// AJFIXO /// NN3BA /// PO3 X /// POCJ CJJ SEMICOL /// CJJJ CJBECAB /// STT STMTCJ STCMPD IF /// STMT STTPOS STTPOS1 THR /// ETHR1POS /// N1111 NUM1 Z /// NBR1 /// AJNP1 AJNP1C ADJC AJJC AJLGC AJLGLKC12 AJNC12 PRNCBAC /// NFIX1E /// AJFIXLK /// AJJA X /// N111 N NCBAX1 NCBAF NCBAFA /// NFIX1Y /// WHCL1X LOC HR /// CJPLYA CM /// STMT STTPOS STTPOS1 SB1 PRON1 THIS /// CMJJCM CMSJCM CM /// SJSJ SJSJSJ SCJAAF /// CM /// PRED1POS RELP1POS EE1POS /// DSJPOS SAJD SAJDB /// DFXLY /// RELOB1 RELAB1 RELAB1V RELABV RLVAAE RLVAAC /// RLVAAF /// XN123 /// POCJ X /// PT ///

NUMBER 400

ARE THESE 632 MICRONS IN HEIGHT.

S Q QQ Q2 Q2AJP EEE2POS /// SB2 PRON2 THESE /// AJOB MST NUM2 Z /// NBR2 NBRHDRDS NBRHDRD NBRMDGT NBR29 /// NBRTENSA NBRTENA NBRMDGTA NBRZO /// NBRMDGTA NBRMDGT NBR29 /// WATT /// NFIX2S /// POMU IN /// WOPOMU PRNCBAG /// PT ///

NUMBER 41

A LITTLE OF THAT CYTOPLASM WHICH IS CYTOPLASM-LIKE AND WHICH IS NOT, STILL, LABELED --((-- NIH-U --))-- , NEVERTHELESS, IS PRACTICALLY ALWAYS THIS, BECAUSE THAT, OF COURSE, IS PRACTICALLY INVARIABLY EXTREMELY LIGHT AND MICROGLIAL .

S STTT STMTCJ STCMPD STMT STTNEG STTNEG3 SB3NEG N333NG QFR3NG QFR33NG QFR3NA XJN X /// QFR3ND /// OF /// DEF3 DFDK3 DKAR3 /// AJNP3 N333 NN3 NN3B CYTO /// NN3BA /// PO3 PO33 WHCL3 WH /// PRED3 PRED3POS AJP3POS EEE3POS /// AJ3OB ADJ3 AJLGLK3 NN3 NN3B CYTO /// NN3BA /// AJFIXLK /// POAJ X /// AND /// PO33 WHCL3 WH /// PRED3 PRED3NEG AJP3NEG EEE3NEG EEE3POS /// NOT /// CMSJCM CM /// SJSJ SJSJSJ SCJAAA /// CM /// AJ3OB AJOBP AJVPSVA LABL /// VPSVFXED /// XAS X /// DND DL /// NPOLAB KIRSCH RAK /// HYN /// LTR /// DR /// CMSJCM CM /// SJSJ SJSJSJ SCJAAF /// CM /// PRED3POS EP3POS E3POS /// DTPOS XJD JD ///

DTPOSA DTPOSAA /// EOB3 PRON3 THIS /// OGRE XCM CM /// CJBECK CJBECA CJBECAA /// STMT STTPOS STTPOS1 SB1 PRON1 THAT /// CMJJCM CMSJCM CM /// SJSJ SCJAAB /// CM /// PRED1POS AJP1POS EEE1POS /// DTPOS XJD JD /// DTPOSA AJDTPOSA AJNEGFXC /// AJBAA VVYBA /// I /// AJFIXABL /// DFXY /// AJOB ADJ ADJV AJJV JAJV JPV AJLGVD /// JFIXLY /// AJ AJJJC AJC AJCA AJCAA AJCAAA /// AJJA AJJB X /// AND /// AJJJ AJJC AJLGC AJLGCC NCBAE /// AJFIXL /// POCJ X /// PT ///

NUMBER B3

DO 10 OF THE SHAPES OF A CONTAINED ARRAY OF A NUMBER OF THOSE DENDRITIC AND QUITE ASTROCYT E-LIKE COLUMNS WHICH ARE INVARIABLY THESE AND WHICH HAVENT BECOME EXTREMELY UNDEFINED AND ASTROCYTIC , SOME MICROGLIAE WHICH HAVE HARDLY EVER BECOME 1017 MICRONS IN HEIGHT AND WHICH ARE DOUBTLESS AS DENCE AS SOME PERIPHERIES AND 11 OF THESE DENSER AND EXTREMELY BLUE KARYOSOM ES EVER HAVE A DISTANCE APART EQUAL TO THAT OF 500 INTERSECTED CENTERS .

S Q QQ Q2 Q2HQP VAUX2 DO /// SB2 N2 N2QFAR PARPLU2 NARPN2 NUM2 Z /// NBR2 NBRTENS NBRTEN NBRMDGT NBR1 /// NBRMDGTA NBRZO /// OF /// DFDK2 DEFAR /// AJNP2 N222 NON2 NON2D NPREN222B PRNC22B PRNCBAS /// NFIX2S /// PONPRENN12 PONPRENN2 OF /// N2 N2CJ N2CJA N2CJA X /// N123 N1 N11 INDEF INDFRA /// AJNP1C ADJC AJJC RELABC XVPLC VPLC VCN /// AJFIXED /// XSB /// AJJA X /// N111 NON1 NON1D NPREN111B PRNV11B VARRB /// PONPRENN12 PONPRENN2 OF /// N2 N2QFAR PARPLU2 NARPN2 ARPN2 QFR2 QFR2C /// OF /// DFDK2 DKAR2 /// AJNP2 ADJ ADJC AJJC AJLGC AJLGCC NCBAD /// AJFIXIC /// AJJA AJJB X /// AND /// AJJJ AJJC JAJC JPC JB /// AJ AJJJV AJLGV AJLGLKV12 NVBAX1 NVBAA /// NFIX1E /// AJFIXLK /// N222 NON2 NON2B NPREN222 PRNCBAL /// NFIX2S /// PONPREN2 X /// PO2 PO22 WHCL2 WH /// PRED2 PRED2POS EP2POS E2POS /// DTPOS XJD X /// DTPOSA AJDTPOSA AJNEGFXC /// AJBAA VVYBA /// I /// AJFIXABL /// DFXY /// EOB2 PRON2 THESE /// AND /// PO22 WHCL2 WH /// PRED2 PRED2NEG AJP2NEG HVAUX2N HVAUX2 /// NOT /// XDNA X /// CPBCPP PPVBC /// AJOBAM ADJ ADJV AJJV JAJV JPV AJLGVD /// JFIXLY /// AJ AJJJV AJLGV AJLGVA AJNEGFXA /// AJLGCAA /// AJJA AJJB X /// AND /// AJJJ AJJV AJLGV AJLGVC NVBAA /// AJFIXIC /// PO1 X /// CM /// N123 N2 N2QFAR QFAR QFR /// AJNP2 N222 NN2 NCBAX2 NCBAE /// NFIX2E /// PO2 PO22 WHCL2 WH /// PRED2 PRED2NEG AJP2NEG HVAUX2 /// XDNB DTNEGB DTNB JC /// DT /// CPBCPP PPVBC /// AJOBAM MST NUM2 Z /// NBR2 NBRTHSNDS NBR1 /// NBRHDRDSA NBRHDRDA

NBRMDGTA NBRZO /// NBRTENSA NBRTENA NBRMDGTA NBRMDGT NBR1 /// NBRMDGTA NBRMDGT NBR29 /// WATT /// NFIX2S /// POMU IN /// WOPOMU PRNCBAG /// AND /// PO22 WHCL2 WH /// PRED2 PRED2POS RELP2POS EE2POS /// DSJPOS SAJD SAJDA /// RELOB2 RLVI AS /// RLDS RLDSB RLDSBNA /// AJFIXE /// AS /// N2 N2QFAR QFAR QFR /// AJNP2 N222 NON2 NON2A NPREN22 PRNCBAP /// NFIX2IES /// PONPREN12 PONPREN2 X /// PO2 X /// AND /// N123 N2 N2QFAR PARPLU2 NARPN2 NUM2 Z /// NBR2 NBRTENS NBRTEN NBRMDGT NBR1 /// NBRMDGTA NBRMDGT NBR1 /// OF /// DFDK2 DKAR2 /// AJNP2 ADJ ADJC AJJC AJCPV AJMR AJCD /// ER /// AJJA AJJB X /// AND /// AJJJ AJJV JAJV JPV AJLGVD /// JFIXLY /// AJ AJJJC AJC AJCC AJCCA /// AJFIXE /// N222 NN2 NCBAX2 NCBAH NCBAHA /// NBAFXA NBAFXAA /// NFIX1E /// NFIX2S /// PO2 X /// PO2 X /// DQ DT /// HQ VHQBAA /// VHQBAB /// HQOB2 INDFRA /// LYZMSTT2A LYZMSTT2AA LYZMSTT2AAC /// EQL EQU /// POEQ POEQN THOF /// N123 N2 N2QFAR QFAR NUM2 Z /// NBR2 NBRHDRDS NBRHDRD NBRMDGT NBR29 /// NBRTENSA NBRTENA NBRMDGTA NBRZO /// NBRMDGTA NBRZO /// AJNP2 ADJ ADJV AJJV RELABV XVPLV VPLV VEDB VNTRSCT /// AJFIXED /// XSB /// AJJA X /// N222 NON2 NON2A NPREN22 PRNCBAO /// NFIX2ERS /// PONPREN12 PONPREN1 X /// PO2 X /// PT ///

NUMBER 189

YES/, THE CYTOPLASM OF THE DENSEST VACUOLE IS PLAINLY THIS/, AND IT FOLLOWS THAT THE MOST EPENDYMAL FLAKE WHICH HAS AN ARRAY EQUAL TO 7 MICRONS IN PERIMETER AND WHICH IS NEVER TWICE AS BLACK AS THAT MARK HAS STAYED VERY MUCH LESS INWARD AND OLIGODENDROGLIO-LIKE .

S A YN YES /// XSTMTCJ SEMICCL /// STMTCJ STCMPD STMT STTPOS STTPOS3 SB3 N3 N33 QFAR3 ARPREAR3 PREAR X /// DFDK1 DEFAR /// AJNP3 N333 NON3 NPREN33 NN3 NN3B CYTO /// NN3BA /// PONPREN12 PONPREN1 OF /// N1 N11 DEF DEFAR /// AJSPV AJMT AJCD /// EST /// N111 N NCBAX1 NCBAG /// NFIX1E /// PO1 X /// PO3 X /// PRED3POS EP3POS E3POS /// DSJPOS SAJD SAJDB /// DFXLY /// EOB3 PRON3 THIS /// ERGO SEMICOL /// AND /// IFT IT /// FW FLLW /// VFXS /// THT /// STMT STTNEG STTNEG1 SB1 N1 N11 DEF DEFAR /// AJSPV AJMT MT /// AJLG AJLGV AJLGVC NVBAB /// AJFIXL /// N111 NON1 NON1C NPREN1111 PRNC111 PRNCBAD /// PONPREN3 X /// PO1 PO11 WHCL1 WH /// PRED1 PRED1POS VP1POS HQ1POS VHQBAA /// VFXS /// HQOB1 LYZMSTT1V INDFRAN /// LYZMSTT1VV XAV X /// LYZMSTT1VVV PRNV11 PRNV11B VARRB /// EQL EQU /// POEQ MST NUM2 Z /// NBR2 NBRDGT NBR29 /// WATT /// NFIX2S /// POMU IN /// WOPOMU PRNCBAE /// AND /// PO11 WHCL1 WH /// PRED1 PRED1NEG RELP1NEG EE1POS /// DTNEGB DTNA /// RELOB1 REL RLV RLVF NBRT HUM TW /// AS /// AJNCT AJC AJCA AJCAA AJCAAB /// AS /// PORLV X /// MARK DFDK1 DKAR1 /// MRK /// PRED1NEG AJP1NEG HVAUX1 /// XDNB X /// CPBCPP PPVRM VRM /// VFXED /// AJOBAM ADJ ADJC AJJC AJCPV PUM JA /// MUCH /// AJLS LS /// AJNCT ADVOR SPQR RLVAAA /// DFIXWD /// AJJA AJJB X /// AND /// AJJJ AJJV AJLGV AJLGLKV12 NVBAX1 NVBAE NVBAEBRV /// NVBAEFUL /// NFIX1O /// AJFIXLK /// PCCJ X /// PT ///

NUMBER 261

YES/, IF THESE, OCCASIONALLY, ARE PRACTICALLY ALWAYS ASTROCYTES , THAT, NEVERTHELESS, IS NOT, HOWEVER, HERE .

S A YN YES /// XSTMTCJ SEMICCL /// STMTCJ STCMPD IF /// STMT STTPOS STTPOS2 SB2 PRON2 THESE /// CMJJCM XCMJJXCM CM /// DTPOSB DTPOSBB UAXACTUN AJDTPOSB /// DFXLY /// CM /// PRED2POS EP2POS E2POS /// DTPOS

XJD JD /// DTPOSA DTPOSAA /// EOB2 EPRDN2 EPRDQFAR EPRDQFR /// AJNP2 N222 NN2 NVBAX2 NVBAA /// NFIX1E /// NFIX2S /// PO2 X /// CJPLYA CM /// STMT STTNEG STTNEG1 SB1 PRON1 THAT /// CMSJCM CM /// SJSJ SJSJSJ SCJAAF /// CM /// PRED1NEG AJP1NEG EEE1NEG EEE1POS /// NOT /// CMSJCM CM /// SJSJ SCJAAE /// CM /// AJOB LOC HR /// POCJ X /// PT ///

NUMBER 309

IS IT INDISPUTABLE THAT SINCE THESE VERY ENDOTHELIAL OBJECTS, NEVERTHELESS, ARE, IN ANY CASE , LABELLED --((-- INSIDE LAYER --))-- , 1 OF THOSE MICROGLIAE OFTEN IS, HOWEVER, LABELED --((-- V --))-- /, EVEN THOUGH THERE IS NO QUITE BIG AND OLIGODENDROGLIAL MICROGLIA 1 MICRON IN PERIMETER.

06

S Q QQ RSVP IS /// IT /// XDQ X /// SAJJD SAJDC /// AJFIXE /// THT /// STTTT STMTCJ STCMPD NACXIT /// STMT STTPOS STTPOS2 SB2 PRON2 PRONP2 DKAR2 /// ADJ ADJC AJJC JAJC JPC JA /// POJA X /// AJ AJJJV AJLGV AJLGVC NVBAD /// AJFIXAL /// AJJA X /// NGEN2 NGEN1 /// NFIX2S /// CMJJCM CMSJCM CM /// SJSJ SJSJSJ SCJAAF /// CM /// PRED2POS AJP2POS EEE2POS /// DSJPOS CMSJCM CM /// SJSJ SCJAAB /// CM /// AJOB AJOBP AJVPSVA LABL /// L /// VPSVFXED /// XAS X /// DND DL /// NPOLAB LIPKIN AJNP1 AJNP1V ADJV AJJV RELABV RLVAAE RLVAAA /// RLVAAF /// AJJA X /// N111 NON1 NON1B NPREN111 PRNC11 PRNCBAJ /// PONPREN2 X /// DR /// CM /// STMT STTPOS STTPOS1 SB1 N1 N11 PARPLU NUM1 Z /// NBR1 /// OF /// DFDK2 DKAR2 /// AJNP2 N222 NN2 NCBAX2 NCBAE /// NFIX2E /// PO1 X /// CMJJCM XCMJJXCM DTPOSB DTPOSBA DTPA DTPAA /// PRED1POS AJP1POS EEE1POS /// DSJPOS CMSJCM CM /// SJSJ SCJAAE /// CM /// AJOB AJOBP AJVPSVA LABL /// VPSVFXED /// XAS X /// DND DL /// NPOLAB KIRSCH Z /// LTR /// DR /// POCJ CJJ SEMICOL /// CJJJ CJBECAB /// STT STMT STTNEG STTNEG1 THR /// ETHR1POS /// N1111NG INDFARNG /// AJNP1 AJNP1C ADJC AJJC JAJC JPC JB /// AJ AJJJC AJC AJCB /// AJJA AJJB X /// AND /// AJJJ AJJV AJLGV AJLGVC NVBAEBRV /// NVBAEFUL /// AJFIXAL /// N111 N NCBAX1 NCBAE /// WHCL1X MST NUM1 Z /// NBR1 /// WATT /// POMU IN /// WOPOMU PRNCBAE /// PT ///

NUMBER 325

ARE THERE OCCASIONALLY 10 DENCE, BLUE AND QUITE BIG ENDOTHELIA WHICH BELONG TO ALL NUCLEOL

OPLASM-LIKE COLAGEN OF THESE INSIDE AND EXTREMELY MEMBRANE-LIKE CENTERS AND 10 NUCLEOLI

AND ALL DARK NUCLEOLOPLASM .

S Q QQ Q2 Q2VP ETHP2 ETHR2POS /// THR /// XDQ DQ DTPOS DTPOSB DTPOSBB UAXACTUN AJDTPOSB /// DFXLY /// N2222QA QFARQ NUM2 Z /// NBR2 NBRTENS NBRTEN NBRMDGT NBR1 /// NBRMDGTA NBRZC /// AJNP2 ADJ ADJC AJJC RELABC RLDS RLDSB RLDSBNA /// AJFIXE /// AJJA AJJB CM /// AJJD AJJJ AJJC AJC AJCC AJCCA /// AJFIXE /// AJJB X /// AND /// AJJJ AJJC JAJC JPC JB /// AJ AJJJC AJC AJCB /// N222 NN2 NVBAX2 NVBAD /// NFIX2A /// WHV2 WH /// VP2 VP2P V2POS VBL /// YTO /// VOB2 PRDN2 N2CJ N2CJA X /// N123 N3 N33 QFAR3 QFR /// AJNP3 ADJ3 AJLGLK3 NN3 NN3B NCBAC /// AJFIXO /// NN3BA /// AJFIXLK /// N333 NON3 NPREN33 NN3 NN3A NN3AA /// PONPREN12 PONPREN2 OF /// N2 N2QFAR QFAR DFDK2 DKAR2 /// AJNP2 ADJ ADJV AJJV RELABV RLVAAE RLVAAA /// RLVAAF /// AJJA AJJB X /// AND /// AJJJ AJJV JAJV JPV AJLGVD /// JFIXLY /// AJ AJJJC AJLGC AJLGLKC12 AJNC12 NCBAX1 NCBAB NCBABD NCBABDA /// NFIX1E /// AJFIXLK /// N222 NON2 NON2A NPREN22 PRNCBAO /// NFIX2ERS /// PONPREN12 PONPREN2 X /// PO2 X /// PO3 X /// AND /// N123 N2 N2CJ N2CJA X /// N123 N2 N2QFAR QFAR NUM2 Z /// NBR2 NBRTENS NBRTEN NBRMDGT NBR1 /// NBRMDGTA NBRZO /// AJNP2 N222 NN2 NCBAX2 NCBAC /// NFIX2I /// PO2 X /// AND /// N123 N3 N33 QFAR3 QFR /// AJNP3 ADJ3 AJJ3A AJCAA AJCAAA /// N333 NN3 NN3B NCBAC /// AJFIXO /// NN3BA /// PO3 X /// PT ///

NUMBER 377

ARE A ROUNDER AND VERY EPENDYMA-LIKE LEAST LARGE AREA 'S AXON'S SHAPE AND ALL CORTICAL NUCLE

OPLASM ALWAYS TWICE AS MUSCLE-LIKE AS THIS MARK.

S Q QQ Q2 Q2RELP EE2POS /// SB2 N2 N2CJ N2CJA X /// N123 N1 N11 INDEF INDFRA /// AJNP1C ADJC AJJC AJCPV AJMR AJCA AJCAB /// ER /// AJJA AJJB X /// AND /// AJJJ AJJC JAJC JPC JA /// POJA X /// AJ AJJJV AJLGV AJLGLKV12 NVBAX1 NVBAB /// AJFIXLK /// N111 NON1 NON1D AJNP11 AJSPV AJLT LT /// AJNCT AJC AJCC AJCCB /// AJFIXE /// N111 NON1 NON1A AJNP11 AJNP1 AJNP1V N111V PRNV1 PRNVBAA /// PONPREN12 PONPREN2 X /// ARGEN /// NPREN11 PRNV1 PRNVBA /// ARGEN /// NPREN111B PRNC11B PRNCBAS /// PO1 X /// AND /// N123 N3 N33 QFAR3 QFR /// AJNP3 ADJ3 AJJ3B NCBAABA /// AJFIXICAL /// N333 NN3 NN3B NCBAC /// AJFIXO /// NN3BA /// PO3 X /// DQ DTPOS XJD X /// DTPOSA DTPOSAA /// RELOB2 REL RLV RLVF NBRT HUM TW /// AS /// AJNCT AJLG AJLGC AJLGLKC12 AJNC12 NCBAX1 NCBAB NCBABE NCBABEA /// NFIX1LE /// AJFIXLK /// AS /// PORLV X /// MARK DFDK1 DKAR1 /// MRK /// PT ///

NUMBER 391

LABEL THE QUITE UNDEFINED AND FAR APART DENDRITE WITH THE LABEL --((-- THIS EXTREMELY IRREGULAR , QUITE BIG, ARTEFACTAL AND EXTREMELY UNDEFINED ARTEFACT WHICH IS STILL LABELED AS --((-- BIG PROCESS --))-- --))-- .

S DIR DIRR LAB LABL /// DEF111 DEF1 DFDK1 DEFAR /// AJNP1 AJNP1C ADJC AJJC JAJC JPC JB /// AJ AJJJV AJLGV AJLGVA AJNEGFXA /// AJLGCAA /// AJJA AJJB X /// AND /// AJJJ AJJC RELABC RLDS RLDSA RLDSANA /// AP /// N111 N NCBAX1 NCBAD /// NFIX1E /// PONLAB XWTL WITH /// DEFAR /// LABL /// DND DL /// NPOLAB LIPKIN N1 N11 DEF DFDK1 DKAR1 /// AJNP1 AJNP1V ADJV AJJV JAJV JPV AJLGVD /// JFIXLY /// AJ AJJJV AJLGV AJLGVA AJNEGFXB /// AJLGCAB /// AJJA AJJB CM /// AJJD AJJJ AJJC JAJC JPC JB /// AJ AJJJC AJC AJCB /// AJJB CM /// AJJD AJJJ AJJV AJLGV AJLGVC NVBAC /// AJFIXAL /// AJJB X /// AND /// AJJJ AJJV JAJV JPV AJLGVD /// JFIXLY /// AJ AJJJV AJLGV AJLGVA AJNEGFXA /// AJLGCAA /// N111 N NVBAX1 NVBAC /// PO1 PO11 WHCL1 WH /// PRED1 PRED1POS AJP1POS EEE1POS /// DSJPOS SJSJSJ SCJAAA /// AJO8 AJO8P AJVPSVA LABL /// VPSVFXED /// XAS AS /// DND DL /// NPOLAB LIPKIN AJNP1 AJNP1C ADJC AJJC AJC AJCB /// AJJA X /// N111 N NCBAX1 NCBAA NCBAAA /// DR /// DR /// PT ///

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